

May 2, 2003

V. Michael Alverson
Whiting Clean Energy, Inc.
2155 Standard Avenue
Whiting, Indiana 46394

Re: 089-15716-00449
First Significant Modification to
CP 089-11194-00449

Dear Mr. Alverson:

Whiting Clean Energy, Inc. was issued a PSD permit on July 20, 2000 authorizing the construction and operation of an industrial steam and electric power cogeneration plant consisting of two combustion turbines, two supplementary heat recovery steam generators with two duct burners, one condensing steam turbine generator, and one induced draft cooling tower. An application requesting changes to this permit was received on June 07, 2002. Pursuant to the provisions of 326 IAC 2-2 and IC 13-15-7-1 a significant modification to this permit is hereby approved as described in the attached Technical Support Document.

The permit is hereby modified as follows:

(a) Any reference of "The Office of Air Management" was changed to "The Office of Air Quality" to reflect the change in the office's name throughout the permit

(b) Conditions D.1.2 and D.1.3 are modified to read as follows

D.1.2 Nitrogen Oxides (NO_x) Emission Limitations

(a) Pursuant to 326 IAC 2-2 (PSD Requirements) and 326 IAC 2-3 (Emission Offset Requirements), each combustion turbine/steam generating unit shall comply with the following, excluding the startup and shutdown periods:

- (1) During normal operation, the NO_x emissions from each combustion turbine stack shall not exceed 3.0 ppmvd at 15 percent oxygen, based on a 3-hour rolling average, which is equivalent to 19.5 pounds NO_x per hour at ISO conditions.
- (2) During normal operation, the NO_x emissions from each combustion turbine stack, when its associated duct burner is operating, shall not exceed 3.0 ppmvd at 15 percent oxygen, based on a 3-hour rolling average, which is equivalent to 38.0 pounds NO_x per hour at ISO conditions.
- (3) The duct burners shall not be operated until normal operation begins.
- (4) Each combustion turbine shall be equipped with dry low-NO_x burners and operated using good combustion practices to control NO_x emissions.
- (5) A selective catalytic reduction (SCR) system shall be installed and operated at all times, except during periods of startup/shutdown, to control NO_x emissions.

- (b) Pursuant to 326 IAC 12 and 40 CFR 60, Subpart Da (NSPS for Electric Utility Steam Generating Units), each duct burner shall not exceed 1.6 pounds/MW-hr gross energy output on a 30-day rolling average.
- (c) Pursuant to 326 IAC 12 and 40 CFR 60, Subpart GG (NSPS for Stationary Gas Turbines), the NO_x emissions from each combustion turbine shall not exceed the following:

$$\text{STD} = 0.0075 \times ((14.4)/Y) + F$$

where:

STD	=	Allowable NO _x percent by volume @ 15% O ₂ , dry basis
Y	=	Heat Rate not to exceed 14.4 kilojoules per watt-hr
F	=	NO _x emission allowance for fuel-bound nitrogen as defined in paragraph (a)(3) of 40 CFR 60.332.

- (d) The Permittee may use NO_x CEM data to demonstrate compliance with 40 CFR Part 60, Subpart Da, and (a) and (c) of this Section. The performance test for the NO_x CEM must be taken after startup, as required under 40 CFR60.8, not during startup.
- (e) To demonstrate compliance with (b) of this Section, the Permittee shall use continuous fuel flowmeters following the appropriate measurement procedures specified in Appendix D to Part 75. The hourly NO_x mass rate will be calculated by equation three (3) of 40 CFR60.46a (k)(2)(iv).
 - (1) The compliance provision under 40 CFR60.46a(k)(3) requires measurement of NO_x emissions at a point where emissions from the Duct Burners combine with the emissions from the Combustion Turbines, connected to a stack. This will allow measurement of NO_x from the entire system.
 - (2) The equation in Appendix D to Part 72 shall be used to calculate the actual gross electrical output, using the actual heat input instead of the maximum design heat input. The hourly emissions (lb/hr) from the NO_x CEM will be divided by the actual gross electrical output to yield values in terms of the standard (lb NO_x/Mwh). The performance test for the NO_x CEM must be conducted after startup, as required under 40 CFR Section 60.8.

D.1.3 Carbon Monoxide (CO) Emission Limitations

Pursuant to 326 IAC 2-2 (PSD Requirements), each steam generating unit shall comply with the following, excluding startup and shutdown periods:

- (a) During normal operation, the CO emissions from each combustion turbine stack shall not exceed 0.016 pounds per MMBtu, which is equivalent to 28.0 pounds CO per hour.
- (b) During normal operation, the CO emissions from each combustion turbine stack, when its associated duct burner is operating, shall not exceed 0.037 pounds per MMBtu, which is equivalent to 93.7 pounds CO per hour.
- (c) Good combustion practices shall be applied to minimize CO emissions.
- (d) The duct burners shall not be operated until normal operation begins.

- (c) A new Condition D.1.9 was added to the permit and all conditions following the new added condition were renumbered to reflect the addition of the new condition.

D.1.9 Startup and Shutdown Limitations for Combustion Turbines

Pursuant to 326 IAC 2-2 (PSD Requirements) each combustion turbine shall comply with the following:

- (a) A startup is defined as the operation in the period of time from the initiation of combustion until the turbine reaches a minimum load of seventy (70) percent or instantaneous outlet SCR NOx concentration reaches a level less than of 3 ppmvd at 15% O2 for a period of 5 minutes whichever occurs earlier.
 - (b) A Shutdown is defined as operation at less than fifty (50) percent load descending to flame out.
 - (c) A Startup or shutdown period shall not exceed four (4) hours. Each turbine shall not exceed 473 hours per year for startups and 260 hours per year for shutdowns with compliance demonstrated at the end of each month.
 - (d) The NOx emissions from each combustion turbine stack shall not exceed 510 pounds per startup and 49 pounds per shutdown. Each combustion turbine shall not exceed 41.5 tons per year of startup and shutdown emissions.
 - (e) The CO emissions from each combustion turbine stack shall not exceed 1,571 pounds per startup, and 220 pounds per shutdown. Each combustion turbine shall not exceed 168.7 tons per year of startup and shutdown emissions.
- (d) Conditions D.1.13, D.1.14, D.1.16 and D.1.17 (now conditions D.1.14, D.1.15, D.1.17 and D.1.18) were changed as follows:

D.1.14 Performance Testing

- (a) Pursuant to 326 IAC 2-1.1-11, 326 IAC 2-2, 326 IAC 2-3, and 326 IAC 12, the following compliance stack tests for each combustion turbine stack shall be performed within 60 days of commercial operation, as defined in Condition C.5, but no later than 180 days after initial start-up, except for hexane stack testing which shall be performed no later than 180 days after final issuance of the significant modification 089-15716-00449 of this permit:
 - (1) Combustion Turbines (Normal Operation) - PM, opacity, and VOC emission limits established in D.1.1(a), (d), (e)(1) and D.1.5(a)(1) shall be demonstrated for each combustion turbine at maximum load;

- (2) Combustion Turbines (Normal Operation) - NO_x and CO emission limits of D.1.2(a)(1) and D.1.3(a) shall be demonstrated at four points in the normal operating range of each combustion turbine, including the minimum point in the range and peak load;
- (3) Combustion Turbines and Duct Burners (Normal Operation) - PM, PM₁₀, opacity, NO_x, CO, VOC, formaldehyde, Hexane and ammonia emission limits established in D.1.1(b), (c)(1), (c)(2), (e)(2), (f)(1), D.1.2(a)(2), D.1.3(b), D.1.5(a)(2), D.1.7 and D.1.8 shall be demonstrated for each combustion turbine at maximum load when its associated duct burners are in operation.
- (b) Pursuant to 326 IAC 3-5, the Permittee shall conduct performance tests on each combustion turbine stack to certify the continuous emission monitoring (CEM) systems for NO_x and CO.
- (c) A certified CEM system may be used in lieu of a compliance stack test.
- (d) EPA Method 9 opacity tests shall be performed concurrently with the PM and PM₁₀ compliance tests, unless meteorological conditions require rescheduling the opacity tests to another date.
- (e) IDEM, OAQ retains the authority under 326 IAC 2-1-4(f) to require the Permittee to perform additional and future compliance testing as necessary.

D.1.15 Continuous Emission Monitoring

- (a) Pursuant to 326 IAC 2-2, 326 IAC 2-3, 326 IAC 3-5, and 326 IAC 12, the Permittee shall continuously monitor and record the following parameters from each combustion turbine stack to demonstrate compliance with the limitations and operation standards required by Operation Conditions D.1.2, D.1.3 and D.1.9:
 - (1) nitrogen oxide concentration; and
 - (2) oxygen concentration.
 - (3) carbon monoxide concentration
- (b) The continuous monitoring systems shall be installed and operational prior to conducting the performance tests. A monitoring protocol shall be performed in accordance with the applicable procedures under 40 CFR 60, Appendix B, Performance Specification 1 and 326 IAC 3-5 and shall be submitted to:

Indiana Department of Environmental Management
Compliance Data Section, Office of Air Quality
100 North Senate Avenue, P. O. Box 6015
Indianapolis, Indiana 46206-6015

within 60 days of commercial operation, as defined in Condition C.5, but no later than 180 days after initial startup. Verification of operational status shall, as a minimum, include completion of the manufacturer written requirements or recommendations for installation, operation, and calibration of the device.

Compliance with monitoring condition D.1.15(a)(3) is required within 180 days from issuance of this modification.

D.1.17 Recordkeeping Requirement

- (a) The Permittee shall maintain records of the parameters stated in Operation Conditions D.1.6, D.1.11, D.1.14, D.1.15, and D.1.16 to demonstrate compliance with Operation Conditions D.1.1, D.1.2, D.1.3, D.1.4, D.1.5, D.1.7, D.1.8, and D.1.9.
- (b) To document compliance with conditions D.1.9 (d) and D.1.9 (e) the Permittee shall maintain records of the following:
 - (1) The type of operation (i.e. startup or shutdown) with supporting operational data.
 - (2) The duration of all startup and shutdown events and total hours of startup and shutdown.
 - (3) The CEMS data, fuel flow meter data, and method 19 calculations corresponding to each startup and shutdown period.

D.1.18 Reporting Requirement

The Permittee shall submit the following information on a quarterly basis:

- (a) records of excess NO_x emissions (defined in 326 IAC 3-5-7) from the continuous emissions monitoring system for each parameter described in Operation Condition D.1.15 to demonstrate compliance with Operation Condition D.1.2;
 - (b) records of excess CO emissions (defined in 326 IAC 3-5-7) from the continuous emissions monitoring system for each parameter described in Operation Condition D.1.15 to demonstrate compliance with Operation Condition D.1.3;
 - (c) records of excess SO₂ emissions (defined in 40 CFR 60.334(c)(2)) for the parameter described in Operation Condition D.1.15(b) to demonstrate compliance with Operation Condition D.1.4(b);
 - (d) monthly natural gas fuel usage records as required by Operation Condition D.1.16(3) to demonstrate compliance with Operation Condition D.1.1(f)(2) and D.1.11; and
 - (e) A quarterly summary of the information to document compliance with Condition D.1.9(a) shall be submitted to the addresses listed in Section C - General Reporting Requirements, of this permit, using the reporting forms located at the end of this permit, or their equivalent, within thirty (30) days after the end of the quarter being reported.
 - (f) daily records of the annual NO_x and CO emission records as required by Operation Condition D.1.10 to demonstrate compliance with Operation Condition D.1.6 and PSD and Emission Offset Requirements pursuant to 326 IAC 2-2 and 326 IAC 2-3, respectively.
- (e) A new reporting form was added to the permit

Compliance Data Section Quarterly Report

Company Name: Whiting Clean Energy, Inc.
Location: 2155 Standard Avenue, Whiting, Indiana 46394
Permit No.: CP 089-11194-00449
Source/Facility: Two (2) Combustion Turbines, please copy and use separate form for each turbine.
Limits: 473 hours for startups and 260 hours for shutdowns per twelve month period with compliance demonstrated at the end of each month (startup or shutdown shall not exceed 4 hours)

Turbine ID: _____ Year: _____

Month	Column 1 Hours during this month		Column 2 Hours during this month		Column 3 Hours during 12 month period	
	Startup	Shutdown	Startup	Shutdown	Startup	Shutdown

No deviation occurred in this quarter.
Deviation/s occurred in this quarter.

Deviation has been reported on:
Submitted by:
Title / Position:
Signature:
Date:
Phone:

(f) Condition D.1.7 is modified to read as follows:

D.1.7 Formaldehyde and Hexane Limitations pursuant to 326 IAC 2-1.1-5 (Air Quality Requirements), the formaldehyde from each combustion turbine stack shall not exceed 0.0005 pounds of formaldehyde per MMBtu and the hexane emissions from each combustion turbine stack shall not exceed 0.0005 pounds of hexane per MMBtu. The combined emissions from each combustion turbine stack shall not exceed 10 tons per year of formaldehyde or 10 tons per year of hexane.

All other conditions of the permit shall remain unchanged and in effect. Please attach a copy of this modification and the following revised permit pages to the front of the original permit.

This decision is subject to the Indiana Administrative Orders and Procedures Act - IC 4-21.5-3-5. If you have any questions on this matter, please contact Ghassan Shalabi, OAQ, 100 North Senate Avenue, P.O. Box 6015, Indianapolis, Indiana, 46206-6015, or call at (800) 451-6027, press 0 and ask for Ghassan Shalabi or extension (3-0431), or dial (317) 233-0431.

Sincerely,

Signed By
Paul Dubenetzky, Chief
Permits Branch
Office of Air Quality

Attachments

GAS

cc: File - Lake County
Lake County Health Department
Air Compliance Section Inspector- Ramesh Tejuja
Compliance Data Section - Karen Nowak
Administrative and Development - Lisa Lawrence
Technical Support and Modeling - Michele Boner

**CONSTRUCTION PERMIT
for Prevention of Significant Deterioration
OFFICE OF AIR QUALITY**

**Whiting Clean Energy, Inc.
2155 Standard Avenue
Whiting, Indiana 46394**

(herein known as the Permittee) is hereby authorized to construct the facilities listed in Section A (Source Summary) of this permit.

This permit is issued to the above mentioned company (herein known as the Permittee) under the provisions of 326 IAC 2-1.1, 326 IAC 2-2, 326 IAC 2-3, 326 IAC 2-5.1, 40 CFR 52.780 and 40 CFR 124, with conditions listed on the attached pages.

Construction Permit No.: CP-089-11194-00449	
Original issued by: Paul Dubenetzky, Branch Chief Office of Air Quality	Issuance Date: July 20, 2000
First Significant Mod: 089-15716-00449	
Issued by: Signed By Paul Dubenetzky, Branch Chief Office of Air Quality	Issuance Date: May 2, 2003

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SECTION A

SOURCE SUMMARY

This permit is based on information requested by the Indiana Department of Environmental Management (IDEM), Office of Air Quality (OAQ). The information describing the source contained in conditions A.1 and A.2 is descriptive information and does not constitute enforceable conditions. However, the Permittee should be aware that a physical change or a change in the method of operation that may render this descriptive information obsolete or inaccurate may trigger requirements for the Permittee to obtain additional permits or seek modification of this permit pursuant to 326 IAC 2, or change other applicable requirements presented in the permit application.

A.1 General Information

The Permittee owns and operates an industrial steam and electric power cogeneration plant.

Responsible Official: V. Michael Alverson
Source Address: 2155 Standard Avenue, Whiting, Indiana 46394
Mailing Address: 8407 Virginia Street, Merrillville, Indiana 46410
SIC Code: 4911
County Location: Lake
County Status: Nonattainment for PM₁₀, SO₂, and ozone (NO_x and VOC)
Source Status: Major PSD Source for PM, NO₂, and CO
Major Emission Offset Source for PM₁₀, and ozone (NO_x and VOC)
One of the 28 Listed Categories (Fossil Fuel-Fired Steam Electric Plant of more than 250 MMBtu per hour)

A.2 Emission Units and Pollution Control Equipment Summary

This new source for Whiting Clean Energy, Inc., relates to the construction and operation of an industrial steam and electric power cogeneration plant consisting of the following equipment:

(a) Two Combustion Turbines:

Heat Input Capacity: 1,735 MMBtu per hour (HHV) @ ISO conditions, each
Electric Generating Capacity: 166 MWe @ ISO conditions, each
Fuel Source: Natural Gas
Control Technology: Dry Low-NO_x Burners
Stack ID: CT 1 exhausts through HRSG 1 to Stack 1
CT 2 exhausts through HRSG 2 to Stack 2

(b) Two Supplementary Heat Recovery Steam Generators with Two Duct Burners:

Steam Generating Capacity: 1300 psig
Duct Burner Heat Input Capacity: 821 MMBtu per hour (HHV), each
Fuel Source: Natural Gas
Control Technology: Low NO_x Burners and Selective Catalytic Reduction (SCR) System for NO_x Control
Steam Production Capacity: 580,000 pounds per hour, each, without duct burners
1,188,000 pounds per hour, each, with duct burners

(c) One Condensing Steam Turbine Generator:

Electric Generating Capacity: 213 MWe @ 1,600,000 pounds per hour steam

(d) Induced Draft Cooling Tower:

System Technology: 5 cycle, 10 cell, induced draft cooling tower
Water Circulation Rate: 160,000 gallons per minute non-contact cooling water
Control Technology: Mist Eliminator for PM Control

A.3 Part 70 Permit Applicability [326 IAC 2-7-2]

- (a) This stationary source will be required to have a Part 70 permit by 326 IAC 2-7-2 (Applicability) because it is a major source as defined in 326 IAC 2-7-1(22).
- (b) This new source shall apply for a Part 70 (Title V) operating permit within twelve (12) months after this source becomes subject to Title V.

A.4 Acid Rain Permit Applicability [40 CFR 72.30]

- (a) This stationary source shall be required to have a Phase II, Acid Rain permit by 40 CFR 72.30 (Applicability) because the combustion turbines are new units under 40 CR 72.6.
- (b) The source cannot operate the combustion units until their Phase II, Acid Rain permit has been issued.

Section B

Construction Conditions

B.1 General Construction Conditions

- (a) This permit is based on the data and information submitted by the Permittee. Any change in the design or operation of the plant that could increase emissions or change applicable air pollution control requirements may require that the permit be amended in accordance with 326 IAC 2 as set forth in condition B.4 of this permit.
- (b) This permit to construct does not relieve the Permittee of the responsibility to comply with the provisions of the Indiana Environmental Management Law (IC 13-11 through 13-20; 13-22 through 13-25; and 13-30), the Air Pollution Control Law (IC 13-17) and the rules promulgated thereunder, as well as other applicable local, state, and federal requirements.
- (c) Notwithstanding Construction Condition B.4, all requirements and conditions of this construction permit shall remain in effect unless modified in a manner consistent with procedures established for modifications of construction permits pursuant to 326 IAC 2 (Permit Review Rules).
- (d) When the facility is constructed and placed into commercial operation, the operation conditions required by Section C and Section D shall be met.

B.2 Effective Date of the Permit

Pursuant to 40 CFR Parts 124.15, 124.19 and 124.20, the effective date of this permit will be thirty (30) days from its issuance if comments are received. Three (3) days shall be added to the thirty (30) day period, if service of notice is by mail. If no public comments are received, then the permit shall be effective immediately upon issuance.

B.3 Permit Revocation

Pursuant to 326 IAC 2-1.1-9(5)(Revocation of Permits), this permit may be revoked if construction is not commenced within eighteen (18) months after receipt of this approval or if construction is suspended for a continuous period of one (1) year or more.

B.4 First Time Operation Permit

This document shall also become a first-time operation permit pursuant to 326 IAC 2-5.1-3 (Permits) when, prior to start of operation, the following requirements are met:

- (a) Any modifications required by 326 IAC 2-1.1 and 326 IAC 2-7-10.5 as a result of a change in the design or operation of emissions units described by this permit have been obtained prior to obtaining an Operation Permit Validation Letter.
- (b) The attached affidavit of construction shall be submitted to:

Indiana Department of Environmental Management
Permit Administration & Development Section, Office of Air Quality
100 North Senate Avenue, P. O. Box 6015
Indianapolis, IN 46206-6015

verifying that the facilities were constructed as proposed in the application and subsequently received approvals from IDEM, OAQ.

- (1) The facilities covered in the Construction Permit may begin operating on the date the Affidavit of Construction is postmarked or hand delivered to IDEM, OAQ if the

provisions of 40 CFR Parts 72-80 (Acid Rain Program) are not applicable to such facilities.

- (2) If the facilities are subject to the provisions of 40 CFR Parts 72-80 (Acid Rain Program), then the proper Phase II, Acid Rain permit must be issued to such facilities before operation can commence.
- (c) If construction is completed in phases; i.e., the entire construction is not done continuously, a separate affidavit must be submitted for each phase of construction. Any permit conditions associated with operation start up dates such as stack testing for New Source Performance Standards (NSPS) shall be applicable to each individual phase.
- (d) The Permittee shall receive an Operation Permit Validation Letter from the Chief of the Permit Administration & Development Section and attach it to this document.
- (e) The operation permit will be subject to annual operating permit fees pursuant to 326 IAC 2-7-19 (Fees).
- (f) Pursuant to 326 IAC 2-7-4, the Permittee shall apply for a Title V operating permit within twelve (12) months after the source becomes subject to Title V. This 12-month period starts at the postmarked submission date of the Affidavit of Construction. If the construction is completed in phases, the 12-month period starts at the postmarked submission date of the Affidavit of Construction that triggers the Title V applicability. The operation permit issued shall contain as a minimum the conditions in the Operation Conditions section of this permit.

B.5 NSPS Reporting Requirement

Pursuant to the New Source Performance Standards (NSPS), Part 60.7 and 60.8, the source owner/operator is hereby advised of the requirement to report the following at the appropriate times:

- (a) Commencement of construction date (no later than 30 days after such date);
- (b) Anticipated start-up date (not more than 60 days or less than 30 days prior to such date);
- (c) Actual start-up date (within 15 days after such date); and
- (d) Date of performance testing (at least 30 days prior to such date), when required by a condition elsewhere in this permit.

Reports are to be sent to:

Indiana Department of Environmental Management
Compliance Data Section, Office of Air Quality
100 North Senate Avenue, P. O. Box 6015
Indianapolis, IN 46206-6015

The application and enforcement of these standards have been delegated to IDEM, OAQ. The requirements of 40 CFR Part 60 are also federally enforceable.

SECTION C

SOURCE OPERATION CONDITIONS

Entire Source

General Operation Conditions

C.1 General Operation Conditions

- (a) This permit is based on the data and information supplied by the Permittee. The Indiana statutes from IC 13 and rules from 326 IAC, quoted in conditions in this permit, are those applicable at the time the permit was issued. The Permittee shall comply with all applicable provisions of IC 13 and 326 IAC.
- (b) After obtaining the approval to operate in accordance with Condition B.4 of this permit, the Permittee shall subsequently obtain necessary approvals as required by 326 IAC 2-1.1 and 326 IAC 2-7-10.5.

C.2 Transfer of Permit

- (a) In the event that ownership of this industrial steam and electric power co-generation facility is changed, the Permittee shall notify:

Indiana Department of Environmental Management
Permits Branch, Office of Air Quality
100 North Senate Avenue, P.O. Box 6015
Indianapolis, Indiana 46206-6015

within thirty (30) days of the change. Notification shall include the date or proposed date of said change.

- (b) A written notification shall be sufficient to transfer the permit from the current owner to the new owner.
- (c) IDEM, OAQ shall reserve the right to issue a new permit.

C.3 Permit Revocation

Pursuant to 326 IAC 2-1.1-9(5)(Revocation of Permits), this permit to construct and operate may be revoked for any of the following causes:

- (a) Violation of any conditions of this permit;
- (b) Failure to disclose all the relevant facts, or misrepresentation in obtaining this permit;
- (c) Changes in regulatory requirements that mandate either a temporary or permanent reduction of discharge of contaminants. However, the amendment of appropriate sections of this permit shall not require revocation of this permit;
- (d) Noncompliance with orders issued pursuant to 326 IAC 1-5 (Episode Alert Levels) to reduce emissions during an air pollution episode; or

- (e) For any cause which establishes in the judgment of IDEM, OAQ, the fact that continuance of this permit is not consistent with purposes of 326 IAC 2-1.1 (Permit Review Rules).

C.4 Availability of Permit

Pursuant to 326 IAC 2-5.1-3(e)(4), the Permittee shall maintain the applicable permit on the premises of this source and shall make this permit available for inspection by IDEM, OAQ, or other public official having jurisdiction.

C.5 Preventive Maintenance Plan [326 IAC 1-6-3]

- (a) If required by specific condition(s) in Section D of this approval, the Permittee shall prepare and implement Preventive Maintenance Plans (PMPs) upon commercial operation. Commercial operation is defined as the date in which operations produce steam or electricity for sale. The PMPs are comprised of:
 - (1) Identification of the individual(s) responsible for inspecting, maintaining, and repairing emission control devices;
 - (2) A description of the items or conditions that will be inspected and the inspection schedule for said items or conditions;
 - (3) Identification and quantification of the replacement parts that will be maintained in inventory for quick replacement.
- (b) The Permittee shall implement the Preventive Maintenance Plans as necessary to ensure that failure to implement the Preventive Maintenance Plan does not cause or contribute to a violation of any emission limitation.
- (c) PMPs shall be submitted to IDEM, OAQ upon request and shall be subject to review and approval by IDEM, OAQ. IDEM, OAQ may require the Permittee to revise its Preventive Maintenance Plan whenever lack of proper maintenance causes or contributes to any violation.

C.6 Malfunction Condition

Pursuant to 326 IAC 1-6-2 (Records; Notice of Malfunction):

- (a) A record of all malfunctions, including startups or shutdowns of any facility or emission control equipment, which result in violations of applicable air pollution control regulations or applicable emission limitations shall be kept and retained for a period of three (3) years and shall be made available to IDEM, OAQ or appointed representative upon request.
- (b) When a malfunction of any facility or emission control equipment occurs which results in an exceedance of the limits of this permit that lasts more than one (1) hour, said condition shall be reported to IDEM, OAQ, using the Malfunction Report Forms (2 pages). Notification shall be made by telephone or facsimile, as soon as practicable, but in no event later than four (4) daytime business hours after the beginning of said occurrence.
- (c) Failure to report a malfunction of any emission control equipment shall constitute a violation of 326 IAC 1-6, and any other applicable rules. Information of the scope and expected

duration of the malfunction shall be provided, including the items specified in 326 IAC 1-6-2(a)(1) through (6).

- (d) Malfunction is defined as any sudden, unavoidable failure of any air pollution control equipment, process, or combustion or process equipment to operate in a normal and usual manner. [326 IAC 1-2-39]

Emission Limitations and Standards

C.7 Opacity Emissions

Pursuant to 326 IAC 5-1-2 (Visible Emissions Limitations), except as provided in 326 IAC 5-1-3 (Temporary Exemptions), visible emissions shall meet the following, unless otherwise stated in this permit:

- (a) Opacity shall not exceed an average of twenty percent (20%) in any one (1) six (6) minute averaging period as determined in 326 IAC 5-1-4.
- (b) Opacity shall not exceed sixty percent (60%) for more than a cumulative total of fifteen (15) minutes (sixty (60) readings as measured according to 40 CFR 60, Appendix A, Method 9 or fifteen (15) one (1) minute nonoverlapping integrated averages for a continuous opacity monitor) in a six (6) hour period.

C.8 Fugitive Dust Emissions

The Permittee shall not allow fugitive dust to escape beyond the property line or boundaries of the property, right-of-way, or easement on which the source is located, in a manner that would violate 326 IAC 6-4 (Fugitive Dust Emissions). 326 IAC 6-4-2(4) is not federally enforceable.

C.9 Operation of Equipment [326 IAC 2-5.1-3]

Except during periods of startup and shutdown or as otherwise provided in this permit, all air pollution control equipment listed in this permit and used to comply with an applicable requirement shall be operated at all times that an emission unit vented to the control equipment is in operation.

C.10 Stack Height Provisions

The Permittee shall comply with the applicable provisions of 326 IAC 1-7 (Stack Height Provisions), for all exhaust stacks through which a potential (before controls) of twenty-five (25) tons per year or more of particulate matter or sulfur dioxide is emitted.

Testing Requirements

C.11 Performance Testing [326 IAC 3-6][326 IAC 2-1.1-11]

- (a) Compliance testing on new emission units shall be conducted within 60 days after achieving maximum production rate, but no later than 180 days after initial start-up, if specified in Section D of this approval. All testing shall be performed according to the provisions of 326 IAC 3-6 (Source Sampling Procedures), except as provided elsewhere in this approval, utilizing any applicable procedures and analysis methods specified in 40 CFR 51, 40 CFR 60, 40 CFR 61, 40 CFR 63, 40 CFR 75, or other procedures approved by IDEM, OAQ. A test protocol, except as provided elsewhere in this approval, shall be submitted to:

Indiana Department of Environmental Management
Compliance Data Section, Office of Air Quality
100 North Senate Avenue, P. O. Box 6015
Indianapolis, Indiana 46206-6015

no later than thirty-five (35) days prior to the intended test date. The Permittee shall submit a notice of the actual test date to the above address so that it is received at least two weeks prior to the test date.

- (b) All test reports must be received by IDEM, OAQ within forty-five (45) days after the completion of the testing. An extension may be granted by the IDEM, OAQ, if the source submits to IDEM, OAQ, a reasonable written explanation within five (5) days prior to the end of the initial forty-five (45) day period.

Compliance Monitoring Requirements

C.12 Compliance Monitoring [326 IAC 2-1.1-11 and 326 IAC 3-5]

Compliance with applicable requirements shall be documented as required by this permit. The Permittee shall be responsible for installing any necessary equipment and initiating any required monitoring related to that equipment. All monitoring and record keeping requirements shall be implemented within 60 days of commercial operation, as defined in Condition C.5, but no later than 180 days after initial startup, except as provided elsewhere in this approval.

C.13 Maintenance of Monitoring Equipment

- (a) In the event that a breakdown of the monitoring equipment occurs, a record shall be made of the times and reasons of the breakdown and efforts made to correct the problem. To the extent practicable, supplemental or intermittent monitoring of the parameter should be implemented at intervals no less frequent than required in Section D of this approval until such time as the monitoring equipment is back in operation. In the case of continuous monitoring, supplemental or intermittent monitoring of the parameter should be implemented at intervals no less than one (1) hour until such time as the continuous monitor is back in operation.
 - (1) In the event of nitrogen oxide monitor failure, the Permittee shall maintain ammonia feed at the rate at which it was being fed prior to the monitor malfunction. If the Permittee is unable to repair the monitoring equipment, a backup analyzer shall be installed within 48 hours of the time of the initial monitor failure.
 - (2) In the event of oxygen monitor failure, the Permittee shall maintain the NOx concentration at the same level which it was being held prior to the monitor malfunction. If the Permittee is unable to repair the monitoring equipment, a backup analyzer shall be installed within 48 hours of the initial monitor failure.
- (b) The Permittee shall install, calibrate, quality assure, maintain, and operate all necessary monitors and related equipment. In addition, prompt corrective action shall be initiated whenever indicated.
- (c) The Permittee is not required to operate the continuous emissions monitor when its associated production equipment is not in operation.

C.14 Monitoring Methods

Any monitoring or testing performed to meet the requirements of this permit shall be performed, according to the provisions of 326 IAC 3, 40 CFR 60, Appendix A, or other approved methods as specified in this permit.

C.15 Visible Emission Determination

Pursuant to 326 IAC 5, 326 IAC 6, and 326 IAC 12, visible emissions from the source shall be measured using one or both of the following procedures to demonstrate compliance with the opacity limitations:

- (a) visible emissions observations performed in accordance with the applicable procedures under 326 IAC 5-1-4 and 40 CFR 60, Appendix A, Method 9; or
- (b) continuous opacity monitoring data recorded in accordance with the applicable procedures under 40 CFR 60, Appendix B, Performance Specification 1 and 326 IAC 3-1.1.

A violation determined by one of the above methods shall not be refuted by the other method.

Corrective Actions and Response Steps

C.16 Compliance Monitoring Plan - Failure to Take Response Steps [326 IAC 1-6]

- (a) The Permittee is required to implement a compliance monitoring plan to ensure that reasonable information is available to evaluate its continuous compliance with applicable requirements. This compliance monitoring plan is comprised of:
 - (1) This condition;
 - (2) The Compliance Determination Requirements in Section D of this approval;
 - (3) The Compliance Monitoring Requirements in Section D of this approval;
 - (4) The Record Keeping and Reporting Requirements in Section C (Monitoring Data Availability, General Record Keeping Requirements, and General Reporting Requirements) and in Section D of this approval; and
 - (5) A Compliance Response Plan (CRP) for each compliance monitoring condition of this approval. CRPs shall be submitted to IDEM, OAQ upon request and shall be subject to review and approval by IDEM, OAQ. The Permittee shall prepare and implement the CRPs upon commercial operation, as defined in Condition C.5. The CRPs are comprised of:
 - (A) Response steps that will be implemented in the event that compliance related information indicates that a response step is needed pursuant to the requirements of Section D of this approval; and
 - (B) A time schedule for taking such response steps including a schedule for devising additional response steps for situations that may not have been predicted.
- (b) For each compliance monitoring condition of this approval, appropriate response steps shall be taken when indicated by the provisions of that compliance monitoring condition. Failure to perform the actions detailed in the compliance monitoring conditions or failure to take the response steps within the time prescribed in the Compliance Response Plan, shall constitute a violation of the approval unless taking the response steps set forth in the Compliance Response Plan would be unreasonable.
- (c) After investigating the reason for the excursion, the Permittee is excused from taking further response steps for any of the following reasons:

- (1) The monitoring equipment malfunctioned, giving a false reading. This shall be an excuse from taking further response steps providing that prompt action was taken to correct the monitoring equipment.
 - (2) The Permittee has determined that the compliance monitoring parameters established in the approval conditions are technically inappropriate, has previously submitted a request for an administrative amendment to the approval, and such request has not been denied or;
 - (3) An automatic measurement was taken when the process was not operating; or
 - (4) The process has already returned to operating within "normal" parameters and no response steps are required.
- (d) Records shall be kept of all instances in which the compliance related information was not met and of all response steps taken. In the event of an emergency, the provisions of 326 IAC 2-7-16 (Emergency Provisions) requiring prompt corrective action to mitigate emissions shall prevail.

C.17 Actions Related to Noncompliance Demonstrated by a Stack Test

- (a) When the results of a stack test performed in conformance with Section C - Performance Testing, of this approval exceed the level specified in any condition of this approval, the Permittee shall take appropriate corrective actions. The Permittee shall submit a description of these corrective actions to IDEM, OAQ, within thirty (30) days of receipt of the test results. The Permittee shall take appropriate action to minimize emissions from the affected facility while the corrective actions are being implemented. IDEM, OAQ shall notify the Permittee within thirty (30) days, if the corrective actions taken are deficient. The Permittee shall submit a description of additional corrective actions taken to IDEM, OAQ within thirty (30) days of receipt of the notice of deficiency. IDEM, OAQ reserves the authority to use enforcement activities to resolve noncompliant stack tests.
- (b) A retest to demonstrate compliance shall be performed within one hundred twenty (120) days of receipt of the original test results. Should the Permittee demonstrate to IDEM, OAQ that retesting in one-hundred and twenty (120) days is not practicable, IDEM, OAQ may extend the retesting deadline. Failure of the second test to demonstrate compliance with the appropriate approval conditions may be grounds for immediate revocation of the approval to operate the affected facility.

C.18 Emergency Reduction Plans [326 IAC 1-5-2] [326 IAC 1-5-3]

Pursuant to 326 IAC 1-5-2 (Emergency Reduction Plans; Submission):

- (a) The Permittee shall prepare written emergency reduction plans (ERPs) consistent with safe operating procedures.
- (b) These ERPs shall be submitted for approval to:

Indiana Department of Environmental Management
Compliance Branch, Office of Air Quality
100 North Senate Avenue, P.O. Box 6015
Indianapolis, Indiana 46206-6015

within 180 days from the date on which this source commences operation.

- (c) If the ERP is disapproved by IDEM, OAQ, the Permittee shall have an additional thirty (30) days to resolve the differences and submit an approvable ERP.
- (d) These ERPs shall state those actions that will be taken, when each episode level is declared, to reduce or eliminate emissions of the appropriate air pollutants.
- (e) Said ERPs shall also identify the sources of air pollutants, the approximate amount of reduction of the pollutants, and a brief description of the manner in which the reduction will be achieved.
- (f) Upon direct notification by IDEM, OAQ, that a specific air pollution episode level is in effect, the Permittee shall immediately put into effect the actions stipulated in the approved ERP for the appropriate episode level. [326 IAC 1-5-3]

Record Keeping and Reporting Requirements

C.19 Emission Statement [326 IAC 2-6]

- (a) The Permittee shall submit an annual emission statement certified pursuant to the requirements of 326 IAC 2-6, that must be received by April 15 of each year and must comply with the minimum requirements specified in 326 IAC 2-6-4. The annual emission statement shall meet the following requirements:
 - (1) Indicate actual emissions of criteria pollutants from the source, in compliance with 326 IAC 2-6 (Emission Reporting);
 - (2) Indicate actual emissions of other regulated pollutants from the source, for purposes of Part 70 fee assessment.
- (b) The annual emission statement covers the twelve (12) consecutive month time period starting December 1 and ending November 30. The annual emission statement must be submitted to:

Indiana Department of Environmental Management
Technical Support and Modeling Section, Office of Air Quality
100 North Senate Avenue, P. O. Box 6015
Indianapolis, Indiana 46206-6015
- (c) The annual emission statement required by this permit shall be considered timely if the date postmarked on the envelope or certified mail receipt, or affixed by the shipper on the private shipping receipt, is on or before the date it is due. If the document is submitted by any other means, it shall be considered timely if received by IDEM, OAQ, on or before the date it is due.

C.20 Monitoring Data Availability

- (a) With the exception of performance tests conducted in accordance with Section C - Performance Testing, all observations, sampling, maintenance procedures, and record keeping, required as a condition of this approval shall be performed at all times the equipment is operating at normal representative conditions.

- (b) As an alternative to the observations, sampling, maintenance procedures, and record keeping of subsection (a) above, when the equipment listed in Section D of this approval is not operating, the Permittee shall either record the fact that the equipment is shut down or perform the observations, sampling, maintenance procedures, and record keeping that would otherwise be required by this approval.
- (c) If the equipment is operating but abnormal conditions prevail, additional observations and sampling should be taken with a record made of the nature of the abnormality.
- (d) If for reasons beyond its control, the operator fails to make required observations, sampling, maintenance procedures, or record keeping, reasons for this must be recorded.
 - (1) At its discretion, IDEM, OAQ may excuse such failure providing adequate justification is documented and such failures do not exceed five percent (5%) of the operating time in any quarter.
 - (2) Temporary, unscheduled unavailability of staff qualified to perform the required observations, sampling, maintenance procedures, or record keeping shall be considered a valid reason for failure to perform the requirements stated in (a) above.

C.21 General Recordkeeping Requirements

- (a) Records of all required monitoring data and support information shall be retained for a period of at least five (5) years from the date of monitoring sample, measurement, report, or application. These records shall be kept at the source location for a minimum of three (3) years and available upon the request of an IDEM, OAQ representative. The records may be stored elsewhere for the remaining two (2) years as long as they are available within a reasonable time upon request. If the Commissioner makes a written request for records to the Permittee, the Permittee shall furnish the records to the Commissioner within a reasonable time.
- (b) Records of required monitoring information shall include, where applicable:
 - (1) The date, place, and time of sampling or measurements;
 - (2) The dates analyses were performed;
 - (3) The company or entity performing the analyses;
 - (4) The analytic techniques or methods used;
 - (5) The results of such analyses; and
 - (6) The operating conditions existing at the time of sampling or measurement.
- (c) Support information shall include, where applicable:
 - (1) Copies of all reports required by this approval;
 - (2) All original strip chart recordings for continuous monitoring instrumentation;
 - (3) All calibration and maintenance records;

- (4) Records of preventive maintenance shall be sufficient to demonstrate that failure to implement the Preventive Maintenance Plan did not cause or contribute to a violation of any limitation on emissions or potential to emit. To be relied upon subsequent to any such violation, these records may include, but are not limited to: work orders, parts inventories, and operator's standard operating procedures. Records of response steps taken shall indicate whether the response steps were performed in accordance with the Compliance Response Plan required by Section C - Compliance Monitoring Plan - Failure to take Response Steps, of this approval, and whether a deviation from an approval condition was reported. All records shall briefly describe what maintenance and response steps were taken and indicate who performed the tasks.
- (d) All record keeping requirements not already legally required shall be implemented upon commercial operation.

C.22 General Reporting Requirements

- (a) The reports required by conditions in Section D of this approval shall be submitted to:

Indiana Department of Environmental Management
Compliance Data Section, Office of Air Quality
100 North Senate Avenue, P. O. Box 6015
Indianapolis, Indiana 46206-6015
- (b) Unless otherwise specified in this approval, any notice, report, or other submission required by this approval shall be considered timely if the date postmarked on the envelope or certified mail receipt, or affixed by the shipper on the private shipping receipt, is on or before the date it is due. If the document is submitted by any other means, it shall be considered timely if received by IDEM, OAQ on or before the date it is due.
- (c) Unless otherwise specified in this approval, any quarterly report shall be submitted within thirty (30) days of the end of the reporting period.
- (d) The first report shall cover the period commencing on the date of commercial operation and ending on the last day of the reporting period.

SECTION D.1 FACILITY OPERATION CONDITIONS

(a) Two Combustion Turbines (CTs):

Heat Input Capacity: 1,735 MMBtu per hour (HHV) @ ISO conditions, each
Electric Generating Capacity: 166 MWe @ ISO conditions, each
Fuel Source: Natural Gas
Control Technology: Dry Low-NOx Burners and Selective Catalytic Reduction
Stack ID: CT 1 exhausts through HRSG 1 to Stack 1
CT 2 exhausts through HRSG 2 to Stack 2

(b) Two Supplementary Heat Recovery Steam Generators (HRSGs) with Two Duct Burners:

Steam Generating Capacity: 1300 psig
Duct Burner Heat Input Capacity: 821 MMBtu per hour (HHV), each
Fuel Source: Natural Gas
Control Technology: Low NOx Burners and Selective Catalytic Reduction
Steam Production Capacity: 580,000 pounds per hour, each, without duct burners
1,188,000 pounds per hour, each, with duct burners

(c) One Condensing Steam Turbine Generator:

Electric Generating Capacity: 213 MWe @ 1,600,000 pounds per hour steam

(d) Induced Draft Cooling Tower:

System Technology: 5 cycle, 10 cell, induced draft cooling tower
Water Circulation Rate: 160,000 gallons per minute non-contact cooling water
Control Technology: Mist Eliminator

(The information describing the process contained in this facility description box is descriptive information and does not constitute enforceable conditions.)

Emission Limitations and Standards

D.1.1 Particulate Matter (PM and PM₁₀) Emission Limitations

- (a) Pursuant to 326 IAC 2-2 (PSD Requirements), the total PM emissions from each combustion turbine stack shall not exceed 0.0045 pounds per MMBtu which is equivalent to 7.8 pounds per hour.
- (b) Pursuant to 326 IAC 2-2 (PSD Requirements), the total PM emissions from each combustion turbine stack, when its associated duct burner is operating, shall not exceed 0.0045 pounds per MMBtu which is equivalent to 11.5 pounds per hour.
- (c) Pursuant to 326 IAC 12 and 40 CFR 60, Subpart Da (New Source Performance Standards (NSPS) for Electric Utility Steam Generating Units), each steam generating unit shall comply to the following:

- (1) The opacity from each combustion turbine stack, when its associated duct burner is operating, shall not exceed 20 percent (6-minute average), except for one 6-minute period per hour of not more than 27 percent. The opacity standards apply at all times, except during periods of startup, shutdown or malfunction. This satisfies the opacity limitations required by 326 IAC 5-1 (Opacity Limitations).
- (2) The PM emissions from each duct burner shall not exceed 0.03 pounds per MMBtu heat input.
- (d) Pursuant to 326 IAC 2-2 (PSD Requirements) and 326 IAC 2-3 (Emission Offset Requirements), the opacity from each combustion turbine stack shall not exceed 20 percent (6-minute average), except for one 6-minute period per hour of not more than 27 percent. The opacity standards apply at all times, except during periods of startup, shutdown or malfunction. This satisfies the opacity limitations required by 326 IAC 5-1 (Opacity Limitations).
- (e) Pursuant to 326 IAC 6-1-2 (Nonattainment Area Particulate Limitations), each steam generating unit shall comply with the following:
 - (1) Pursuant to 326 IAC 6-1-2(a), the PM emissions from each combustion turbine stack shall not exceed 0.03 grains per dry standard cubic feet.
 - (2) Pursuant to 326 IAC 6-1-2(b)(5), PM emissions associated with the duct burner from each combustion turbine stack, shall not exceed 0.01 grains per dry standard cubic feet.
- (f) To avoid the requirements of 326 IAC 2-3 (Emission Offset Requirements) for PM₁₀:
 - (1) the PM₁₀ (filterable + condensable) emissions from each combustion turbine stack, when its associated duct burner is operating, shall not exceed 11.5 pounds per hour; and
 - (2) the combined natural gas fuel usage from the duct burners shall not exceed 8,052 MMSCF per year, based on a 12 consecutive month period.

D.1.2 Nitrogen Oxides (NO_x) Emission Limitations

- (a) Pursuant to 326 IAC 2-2 (PSD Requirements) and 326 IAC 2-3 (Emission Offset Requirements), each combustion turbine/steam generating unit shall comply with the following, excluding the startup and shutdown periods:
 - (1) During normal operation, the NO_x emissions from each combustion turbine stack shall not exceed 3.0 ppmvd at 15 percent oxygen, based on a 3-hour rolling average, which is equivalent to 19.5 pounds NO_x per hour at ISO conditions.
 - (2) During normal operation, the NO_x emissions from each combustion turbine stack, when its associated duct burner is operating, shall not exceed 3.0 ppmvd at 15 percent oxygen, based on a 3-hour rolling average, which is equivalent to 38.0 pounds NO_x per hour at ISO conditions.
 - (3) The duct burners shall not be operated until normal operation begins.

- (4) Each combustion turbine shall be equipped with dry low-NO_x burners and operated using good combustion practices to control NO_x emissions.
- (5) A selective catalytic reduction (SCR) system shall be installed and operated at all times, except during periods of startup/shutdown, to control NO_x emissions.
- (b) Pursuant to 326 IAC 12 and 40 CFR 60, Subpart Da (NSPS for Electric Utility Steam Generating Units), each duct burner shall not exceed 1.6 pounds/MW-hr gross energy output on a 30-day rolling average.
- (c) Pursuant to 326 IAC 12 and 40 CFR 60, Subpart GG (NSPS for Stationary Gas Turbines), the NO_x emissions from each combustion turbine shall not exceed the following:

$$STD = 0.0075 \times ((14.4)/Y) + F$$

where:

STD	=	Allowable NO _x percent by volume @ 15% O ₂ , dry basis
Y	=	Heat Rate not to exceed 14.4 kilojoules per watt-hr
F	=	NO _x emission allowance for fuel-bound nitrogen as defined in paragraph (a)(3) of 40 CFR 60.332.
- (d) The Permittee may use NO_x CEM data to demonstrate compliance with 40 CFR Part 60, Subpart Da, and (a) and (c) of this Section. The performance test for the NO_x CEM must be taken after startup, as required under 40 CFR 60.8, not during startup.
- (e) To demonstrate compliance with (b) of this Section, the Permittee shall use continuous fuel flowmeters following the appropriate measurement procedures specified in Appendix D to Part 75. The hourly NO_x mass rate will be calculated by equation three (3) of 40 CFR 60.46a (k)(2)(iv).
 - (1) The compliance provision under 40 CFR 60.46a(k)(3) requires measurement of NO_x emissions at a point where emissions from the Duct Burners combine with the emissions from the Combustion Turbines, connected to a stack. This will allow measurement of NO_x from the entire system.
 - (2) The equation in Appendix D to Part 72 shall be used to calculate the actual gross electrical output, using the actual heat input instead of the maximum design heat input. The hourly emissions (lb/hr) from the NO_x CEM will be divided by the actual gross electrical output to yield values in terms of the standard (lb NO_x/Mwh). The performance test for the NO_x CEM must be conducted after startup, as required under 40 CFR Section 60.8.

D.1.3 Carbon Monoxide (CO) Emission Limitations

Pursuant to 326 IAC 2-2 (PSD Requirements), each steam generating unit shall comply with the following, excluding startup and shutdown periods:

- (a) During normal operation, the CO emissions from each combustion turbine stack shall not exceed 0.016 pounds per MMBtu, which is equivalent to 28.0 pounds CO per hour.
- (b) During normal operation, the CO emissions from each combustion turbine stack, when its associated duct burner is operating, shall not exceed 0.037 pounds per MMBtu, which is equivalent to 93.7 pounds CO per hour.
- (c) Good combustion practices shall be applied to minimize CO emissions.
- (d) The duct burners shall not be operated until normal operation begins.

D.1.4 Sulfur Dioxide (SO₂) Emission Limitations

- (a) Pursuant to 326 IAC 12 and 40 CFR 60, Subpart Da (NSPS for Electric Utility Steam Generating Units), each duct burner shall not exceed 0.20 pounds SO₂ per MMBtu heat input, determined on a 30-day rolling average basis.
- (b) Pursuant to 326 IAC 12 and 40 CFR 60, Subpart GG (NSPS for Stationary Gas Turbines), each combustion turbine shall not exceed 0.015 volume percent SO₂ at 15 percent oxygen (dry basis) and the natural gas fuel shall not exceed 0.8 percent sulfur by weight.
- (c) Pursuant to 326 IAC 7-1.1-2 (SO₂ Emission Limitations), each combustion turbine and its associated duct burner shall not exceed 6.0 pounds SO₂ per MMBtu.
- (d) To avoid the requirements of 326 IAC 2-3 (Emission Offset Rules), the total SO₂ emissions from the combustion turbines and duct burners combined shall not exceed 22.8 pounds SO₂ per hour. This limitation shall satisfy the requirements of 326 IAC 12 and 326 IAC 7-1.1-2.

D.1.5 Volatile Organic Compound (VOC) Emission Limitations

- (a) Pursuant to 326 IAC 8-1-6 (VOC BACT Requirements) and 326 IAC 2-3 (Emission Offset Requirements), the following requirements must be met:
 - (1) The VOC emissions from each combustion turbine stack shall not exceed 0.0016 pounds per MMBtu which is equivalent to 2.8 pounds VOC per hour.
 - (2) The VOC emissions from each combustion turbine stack, when its associated duct burner is operating, shall not exceed 0.0046 pounds per MMBtu which is equivalent to 11.8 pounds VOC per hour.
 - (3) Good combustion practices shall be implemented to minimize VOC emissions.

D.1.6 Emission Reduction Credits

Pursuant to 326 IAC 2-3-1(j) and 326 IAC 2-3-3(a)(5), the source must offset ozone (VOC and NO_x) emissions in accordance with the following:

- (a) The total VOC emission offsets required as a result of this project is 90.4 tons per year. The emission reduction credits shall be obtained from shutdown of the Lubes Unit at BP Amoco Oil (089-00003). If other emission reduction credits are relied upon after issuance of this permit, this permit must be amended to identify and validate those emission reduction credits. All emission reduction credits must be validated by OAQ and creditable prior to startup of the source.
- (b) The total NO_x emission offsets required as a result of this project is 341 tons per year. The emission reduction credits shall be obtained from shutdown of the 76" Hot Strip Mill at Ispat Inland, Inc. (089-00316). If other emission reduction credits are relied upon after issuance of this permit, this permit must be amended to identify and validate those emission reduction credits. All emission reduction credits must be validated by OAQ and creditable prior to startup of the source.
- (c) The total VOC emission offsets obtained from BP Amoco was 382 tons, only 90.4 tons were required for the project, leaving an excess of 291.6 tons. Pursuant to permit 089-12601-00316, 260 tons per year of VOC emission reduction credits were transferred to

Ispat Inland Inc. The total NOx emission offsets obtained from Ispat Inland Inc. was 350, which was exactly the amount required. Whiting Clean Energy has a zero (0) balance of NOx and 31.6 tons of VOC emission reduction credits available until December 2003.

D.1.7 Formaldehyde and Hexane Limitations

Pursuant to 326 IAC 2-1.1-5 (Air Quality Requirements), the formaldehyde emissions from each combustion turbine stack shall not exceed 0.0005 pounds of formaldehyde per MMBtu and the hexane emissions from each combustion turbine stack shall not exceed 0.0005 pounds of hexane per MMBtu. The combined emissions from each combustion turbine stack shall not exceed 10 tons per year of formaldehyde or 10 tons per year of hexane.

D.1.8 Ammonia Limitations

Pursuant to 326 IAC 2-1.1-5 (Air Quality Requirements), the ammonia emissions from each combustion turbine stack shall not exceed 10 ppm.

D.1.9 Startup and shutdown limitations

Pursuant to 326 IAC 2-2 (PSD Requirements) each combustion turbine shall comply with the following:

- (a) A startup is defined as the operation in the period of time from the initiation of combustion until the turbine reaches a minimum load of seventy (70) percent or instantaneous outlet SCR NOx concentration reaches a level less than of 3 ppmvd at 15% O2 for a period of 5 minutes whichever occurs earlier.
- (b) A Shutdown is defined as operation at less than fifty (50) percent load descending to flame out.
- (c) A Startup or shutdown period shall not exceed four (4) hours. Each turbine shall not exceed 473 hours per year for startups and 260 hours per year for shutdowns with compliance demonstrated at the end of each month.
- (d) The NOx emissions from each combustion turbine stack shall not exceed 510 pounds per startup and 49 pounds per shutdown. Each combustion turbine shall not exceed 41.5 tons per year of startup and shutdown emissions.
- (e) The CO emissions from each combustion turbine stack shall not exceed 1,571 pounds per startup, and 220 pounds per shutdown. Each combustion turbine shall not exceed 168.7 tons per year of startup and shutdown emissions.

D.1.10 Annual Emission Limitations

Pursuant to 326 IAC 2-2 (PSD Requirements) and 326 IAC 2-3 (Emission Offset Requirements), the annual source emissions, including startup and shutdown operations, shall not exceed 262 tons of NOx per year and 571 tons of CO per year, based on a 12 consecutive month period.

D.1.11 Operation Limitations

- (a) Pursuant to 326 IAC 2-2 (PSD Requirements) and 326 IAC 2-3 (Emission Offset Requirements), the combined natural gas fuel usage from the duct burners shall not exceed 8,052 MMSCF per year, based on a 12 consecutive month period. This limitation shall also demonstrate that PM10 is not subject to 326 IAC 2-3 (Emission Offset Requirements).

- (b) Pursuant to 326 IAC 2-2 (PSD Requirements) and 326 IAC 2-3 (Emission Offset Requirements), each combustion turbine shall not exceed a heat input rate of 1735 MMBtu per hour, determined on a 30-day rolling average basis. This averaging time shall only account for those periods that the combustion turbine is in operation.

D.1.12 New Source Performance Standards

The combustion turbines and duct burners shall comply with the provisions of 40 CFR 60, Subpart A (General Provisions), 40 CFR 60, Subpart Da (Standards of Performance for Electric Utility Steam Generating Units), and 40 CFR 60, Subpart GG (Standards of Performance for Stationary Gas Turbines) which are incorporated by reference in 326 IAC 12-1.

D.1.13 Preventive Maintenance Plan

A Preventive Maintenance Plan, in accordance with Section C - Preventive Maintenance Plan, of this permit, is required for each combustion turbine and its control device.

Compliance Determination and Monitoring:

D.1.14 Performance Testing

- (a) Pursuant to 326 IAC 2-1.1-11, 326 IAC 2-2, 326 IAC 2-3, and 326 IAC 12, the following compliance stack tests for each combustion turbine stack shall be performed within 60 days of commercial operation, as defined in Condition C.5, but no later than 180 days after initial start-up, except for hexane stack testing which shall be performed no later than 180 days after final issuance of the significant modification 089-15716-00449 of this permit:
 - (1) Combustion Turbines (Normal Operation) - PM, opacity, and VOC emission limits established in D.1.1(a), (d), (e)(1) and D.1.5(a)(1) shall be demonstrated for each combustion turbine at maximum load;
 - (2) Combustion Turbines (Normal Operation) - NO_x and CO emission limits of D.1.2(a)(1) and D.1.3(a) shall be demonstrated at four points in the normal operating range of each combustion turbine, including the minimum point in the range and peak load;
 - (3) Combustion Turbines and Duct Burners (Normal Operation) - PM, PM₁₀, opacity, NO_x, CO, VOC, formaldehyde, Hexane and ammonia emission limits established in D.1.1(b), (c)(1), (c)(2), (e)(2), (f)(1), D.1.2(a)(2), D.1.3(b), D.1.5(a)(2), D.1.7 and D.1.8 shall be demonstrated for each combustion turbine at maximum load when its associated duct burners are in operation.
- (b) Pursuant to 326 IAC 3-5, the Permittee shall conduct performance tests on each combustion turbine stack to certify the continuous emission monitoring (CEM) systems for NO_x and CO.
- (c) A certified CEM system may be used in lieu of a compliance stack test.
- (d) EPA Method 9 opacity tests shall be performed concurrently with the PM and PM₁₀ compliance tests, unless meteorological conditions require rescheduling the opacity tests to another date.

- (e) IDEM, OAQ retains the authority under 326 IAC 2-1-4(f) to require the Permittee to perform additional and future compliance testing as necessary.

D.1.15 Continuous Emission Monitoring

- (a) Pursuant to 326 IAC 2-2, 326 IAC 2-3, 326 IAC 3-5, and 326 IAC 12, the Permittee shall continuously monitor and record the following parameters from each combustion turbine stack to demonstrate compliance with the limitations and operation standards required by Operation Conditions D.1.2, D.1.3 and D.1.9:
 - (1) nitrogen oxide concentration; and
 - (2) oxygen concentration.
 - (3) carbon monoxide concentration.
- (b) The continuous monitoring systems shall be installed and operational prior to conducting the performance tests. A monitoring protocol shall be performed in accordance with the applicable procedures under 40 CFR 60, Appendix B, Performance Specification 1 and 326 IAC 3-5 and shall be submitted to:

Indiana Department of Environmental Management
Compliance Data Section, Office of Air Quality
100 North Senate Avenue, P. O. Box 6015
Indianapolis, Indiana 46206-6015

within 60 days of commercial operation, as defined in Condition C.5, but no later than 180 days after initial startup. Verification of operational status shall, as a minimum, include completion of the manufacturer written requirements or recommendations for installation, operation, and calibration of the device.

Compliance with monitoring condition D.1.15(a)(3) is required within 180 days from issuance of this modification.

D.1.16 Natural Gas Monitoring

- (a) The Permittee shall burn pipeline quality natural gas only. The Permittee shall demonstrate compliance with Operation Conditions D.1.4 (a) thru (c) by monitoring the natural gas per specifications in 40 CFR 60.334(b) on a custom fuel monitoring schedule as follows:
 - (1) Monitoring of the nitrogen content will not be required since pipeline natural gas is the only fuel fired in each turbine.
 - (2) Measurement of the sulfur content of the pipeline natural gas will be conducted by manual sampling followed by analysis. Sulfur content will be determined via any of the following American Society for Testing Materials (ASTM) methods: ASTM D1072-90, ASTM D4084-94, ASTM D4468-85, ASTM D5504-94, ASTM D3246-81. The applicable ranges of some ASTM methods are not adequate to measure the levels of sulfur in some fuel gases. Dilution of samples before analysis (with verification of the dilution ratio) may be used, subject to the approval of the Administrator.

- (3) Initial samples must be collected and analyzed twice a month for six months. If six months of bi-monthly sampling and analysis indicate that the sulfur concentrations are well below the applicable standard with low variability, the sampling frequency will be reduced to quarterly monitoring.
 - (4) If six quarters of quarterly sampling and analysis indicate sulfur concentrations are well below the applicable standard with low variability, the sampling frequency will be reduced to semi-annual monitoring.
 - (5) If any analysis indicate noncompliance with the applicable sulfur limit of 0.8 weight percent in 40CFR Section 60.333(b), samples must be collected and analyzed on a weekly basis while the custom fuel monitoring schedule is re-examined. The Permittee will notify OAQ and U.S. EPA of the exceedances in accordance with 40 CFR Section 60.7(c).
 - (6) If there is a substantial change in fuel quality, samples must be collected and analyzed on a weekly basis while the custom fuel monitoring schedule is re-examined.
 - (7) Records of sample analyses and fuel supply information related to sulfur content of the fuel shall be retained for a least three years and shall be available for inspection upon request.
- (b) The Permittee shall monitor the following parameters for natural gas on a calendar month basis, unless otherwise specified in 40 CFR 60.334(b), to demonstrate compliance with Operation Conditions D.1.2(e)(2), D.1.3, D.1.5(a), and D.1.11:
- (1) hourly natural gas flowrate to each combustion turbine and duct burner;
 - (2) heat content;
 - (3) natural gas fuel consumption; and

Recordkeeping and Reporting Requirements:

D.1.17 Recordkeeping Requirement

- (a) The Permittee shall maintain records of the parameters stated in Operation Conditions D.1.6, D.1.11, D.1.14, D.1.15, and D.1.16 to demonstrate compliance with Operation Conditions D.1.1, D.1.2, D.1.3, D.1.4, D.1.5, D.1.7, D.1.8, and D.1.9.
- (b) To document compliance with conditions D.1.9 (d) and D.1.9 (e) the Permittee shall maintain records of the following:
 - (1) The type of operation (i.e. startup or shutdown) with supporting operational data.
 - (2) The duration of all startup and shutdown events and total hours of startup and shutdown.
 - (3) The CEMS data, fuel flow meter data, and method 19 calculations corresponding to each startup and shutdown period.

D.1.18 Reporting Requirement

The Permittee shall submit the following information on a quarterly basis:

- (a) records of excess NO_x emissions (defined in 326 IAC 3-5-7) from the continuous emissions monitoring system for each parameter described in Operation Condition D.1.15 to demonstrate compliance with Operation Condition D.1.2;
- (b) records of excess CO emissions (defined in 326 IAC 3-5-7) from the continuous emissions monitoring system for each parameter described in Operation Condition D.1.15 to demonstrate compliance with Operation Condition D.1.3;
- (c) records of excess SO₂ emissions (defined in 40 CFR 60.334(c)(2)) for the parameter described in Operation Condition D.1.15(b) to demonstrate compliance with Operation Condition D.1.4(b);
- (d) monthly natural gas fuel usage records as required by Operation Condition D.1.16(3) to demonstrate compliance with Operation Condition D.1.1(f)(2) and D.1.11;
- (e) a quarterly summary of the information to document compliance with Condition D.1.9(a) shall be submitted to the addresses listed in Section C - General Reporting Requirements, of this permit, using the reporting forms located at the end of this permit, or their equivalent, within thirty (30) days after the end of the quarter being reported; and
- (f) daily records of the annual NO_x and CO emission records as required by Operation Condition D.1.10 to demonstrate compliance with Operation Condition D.1.6 and PSD and Emission Offset Requirements pursuant to 326 IAC 2-2 and 326 IAC 2-3, respectively.

MALFUNCTION REPORT

**INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF AIR QUALITY
FAX NUMBER - 317 233-5967**

**This form should only be used to report malfunctions applicable to Rule 326 IAC 1-6
and to qualify for the exemption under 326 IAC 1-6-4.**

THIS FACILITY MEETS THE APPLICABILITY REQUIREMENTS BECAUSE: IT HAS POTENTIAL TO EMIT 25 LBS/HR PARTICULATES ?_____, 100 LBS/HR VOC ?_____, 100 LBS/HR SULFUR DIOXIDE ?_____, OR 2000 LBS/HR OF ANY OTHER POLLUTANT ?_____. EMISSIONS FROM MALFUNCTIONING CONTROL EQUIPMENT OR PROCESS EQUIPMENT CAUSED EMISSIONS IN EXCESS OF APPLICABLE LIMITATION _____.

THIS MALFUNCTION RESULTED IN A VIOLATION OF: 326 IAC _____ OR, PERMIT CONDITION # _____ AND/OR PERMIT LIMIT OF _____

THIS INCIDENT MEETS THE DEFINITION OF 'MALFUNCTION' AS LISTED ON REVERSE SIDE ? Y N

THIS MALFUNCTION IS OR WILL BE LONGER THAN THE ONE (1) HOUR REPORTING REQUIREMENT ? Y N

COMPANY: _____ PHONE NO. () _____
LOCATION: (CITY AND COUNTY) _____
PERMIT NO. _____ AFS PLANT ID: _____ AFS POINT ID: _____ INSP: _____
CONTROL/PROCESS DEVICE WHICH MALFUNCTIONED AND REASON: _____

DATE/TIME MALFUNCTION STARTED: ____/____/20____ AM / PM

ESTIMATED HOURS OF OPERATION WITH MALFUNCTION CONDITION: _____

DATE/TIME CONTROL EQUIPMENT BACK-IN SERVICE ____/____/20____ AM/PM

TYPE OF POLLUTANTS EMITTED: TSP, PM-10, SO₂, VOC, OTHER: _____

ESTIMATED AMOUNT OF POLLUTANT EMITTED DURING MALFUNCTION: _____

MEASURES TAKEN TO MINIMIZE EMISSIONS: _____

REASONS WHY FACILITY CANNOT BE SHUTDOWN DURING REPAIRS:

CONTINUED OPERATION REQUIRED TO PROVIDE ESSENTIAL*SERVICES: _____

CONTINUED OPERATION NECESSARY TO PREVENT INJURY TO PERSONS: _____

CONTINUED OPERATION NECESSARY TO PREVENT SEVERE DAMAGE TO EQUIPMENT: _____

INTERIM CONTROL MEASURES: (IF APPLICABLE) _____

MALFUNCTION REPORTED BY: _____

_____ TITLE: _____

MALFUNCTION RECORDED BY: _____ (SIGNATURE IF FAXED)
DATE: _____ TIME: _____

**Please note - This form should only be used to report malfunctions
applicable to Rule 326 IAC 1-6 and to qualify for
the exemption under 326 IAC 1-6-4.**

326 IAC 1-6-1 Applicability of rule

Sec. 1. The requirements of this rule (326 IAC 1-6) shall apply to the owner or operator of any facility which has the potential to emit twenty-five (25) pounds per hour of particulates, one hundred (100) pounds per hour of volatile organic compounds or SO₂, or two thousand (2,000) pounds per hour of any other pollutant; or to the owner or operator of any facility with emission control equipment which suffers a malfunction that causes emissions in excess of the applicable limitation.

326 IAC 1-2-39 "Malfunction" definition

Sec. 39. Any sudden, unavoidable failure of any air pollution control equipment, process, or combustion or process equipment to operate in a normal and usual manner. (Air Pollution Control Board; 326 IAC 1-2-39; filed Mar 10, 1988, 1:20 p.m. : 11 IR 2373)

***Essential services** are interpreted to mean those operations, such as, the providing of electricity by power plants. Continued operation solely for the economic benefit of the owner or operator shall not be sufficient reason why a facility cannot be shutdown during a control equipment shutdown. If this item is checked on the front, please explain rationale:

**Indiana Department of Environmental Management
Office of Air Quality
Compliance Data Section
Quarterly Report**

Company Name: Whiting Clean Energy, Inc.
Location: 2155 Standard Avenue, Whiting, Indiana 46394
Permit No.: CP 089-11194-00449
Source/Facility: Duct Burner 1 and Duct Burner 2
Limits: 8,052 MMSCF per year, based on a 12 consecutive month period

YEAR: _____

Month	Facility	Fuel Usage this Month, MMSCF	Fuel Usage Last 12 Months, MMSCF	Fuel Usage Limit, MMSCF/12 consecutive month period
	Duct Burners 1 + 2			8052
	Duct Burners 1 + 2			8052
	Duct Burners 1 + 2			8052

Submitted by: _____

Title / Position: _____

Signature: _____

Date: _____

Phone: _____

**Indiana Department of Environmental Management
Office of Air Quality
Compliance Data Section
Quarterly Report**

Company Name: Whiting Clean Energy, Inc.
Location: 2155 Standard Avenue, Whiting, Indiana 46394
Permit No.: CP 089-11194-00449
Source/Facility: Two (2) Combustion Turbines, please copy and use separate form for each turbine.
Limits: 473 hours for startups and 260 hours for shutdowns per twelve month period with compliance demonstrated at the end of each month (startup or shutdown shall not exceed 4 hours)

Turbine ID: _____ Year: _____

Month	Column 1 Hours during this month		Column 2 Hours during this month		Column 3 Hours during 12 month period	
	Startup	Shutdown	Startup	Shutdown	Startup	Shutdown

No deviation occurred in this quarter.
Deviation/s occurred in this quarter.

Deviation has been reported on: _____
Submitted by: _____
Title / Position: _____
Signature: _____
Date: _____
Phone: _____

**Indiana Department of Environmental Management
Office of Air Quality
Compliance Data Section
Quarterly Report**

Company Name: Whiting Clean Energy, Inc.
Location: 2155 Standard Avenue, Whiting, Indiana 46394
Permit No.: CP 089-11194-00449
Source/Facility: Combustion Turbines and Duct Burners
Limits: 262 tons NOx per year, based on a 12 consecutive month period and
571 tons CO per year, based on a 12 consecutive month period

YEAR:

Month	Facility*	Pollutant	Emissions this Month, tons	Annual Emissions Last 12 Months, tons	Emission Limit, tons/12 consecutive month period
	Combustion Turbines and Duct Burners	NOx			262
		CO			571
	Combustion Turbines and Duct Burners	NOx			262
		CO			571
	Combustion Turbines and Duct Burners	NOx			262
		CO			571

* This limitation includes startup, shutdown and normal operations. Emissions from startup and shutdown operations shall be determined by multiplying the ppm data collected from a compliance stack test or CEM system by the maximum theoretical flow rate for startup and shutdown operations.

Submitted by: _____

Title / Position: _____

Signature: _____

Date: _____

Phone: _____

**Indiana Department of Environmental Management
Office of Air Quality**

Addendum to the
Technical Support Document (TSD) for a Significant Modification to a
Construction and PSD Permit.

Source Background and Description

Source Name:	Whiting Clean Energy, Inc.
Source Location:	2155 Standard Avenue, Whiting, Indiana 46394
County:	Lake
SIC Code:	4911
Operation Permit No.:	CP-089-11194-00449
Operation Permit Issuance Date:	July 20, 2000
Significant Modification No.:	089-15716-00449
Permit Reviewer:	Ghassan Shalabi

On February 15, 2003, the Office of Air Quality (OAQ) had a notice published in The Times in Munster, Indiana and The Post Tribune in Merrillville, Indiana, stating that Whiting Clean Energy, Inc., had applied for a modification application relating to the following:

- (1) Revision to the definition of a "normal operation".
- (2) Revision to the startup and shutdown limitations for NO_x and CO.
- (3) Addition of a Hexane limitation.

The public notice also stated that the IDEM, OAQ proposed to issue the Modification permit for this operation and provided information on how the public could review the proposed approval and other documentation. Finally, the notice informed interested parties that there was a period of thirty (30) days to provide comments on whether or not this permit should be issued as proposed.

- (1) The OAQ made the following revisions. (Language deleted is shown with strikeout and that added is shown in bold):

- (A) Change any reference of "The Office of Air Management" to "The Office of Air Quality" reflecting the change in the office's name throughout the permit as follows:

Office of Air ~~Management~~ **Quality**

- (B) To correct typographical errors, condition D.1.3 and D.1.13 (now condition D.1.14 due to changes made in the response to comment 1 from Mr. Loeschner) are changed as follows:

D.1.3 Carbon Monoxide (CO) Emission Limitations

- (a) Pursuant to 326 IAC 2-2 (PSD Requirements), each steam generating unit shall comply with the following, excluding startup and shutdown periods:

- ~~(1)~~ **(a)** During normal operation (70 percent load or outlet SCR NOx concentration of 3 ppm whichever occurs earlier), the CO emissions from each combustion turbine stack shall not exceed 0.016 pounds per MMBtu, which is equivalent to 28.0 pounds CO per hour.
- ~~(2)~~ **(b)** During normal operation (70 percent load or outlet SCR NOx concentration of 3 ppm whichever occurs earlier), the CO emissions from each combustion turbine stack, when its associated duct burner is operating, shall not exceed 0.037 pounds per MMBtu, which is equivalent to 93.7 pounds CO per hour.
- ~~(3)~~ **(c)** Good combustion practices shall be applied to minimize CO emissions.

D.1.13 **14** Performance Testing

- (a)** Pursuant to 326 IAC 2-1.1-11, 326 IAC 2-2, 326 IAC 2-3, and 326 IAC 12, the following compliance stack tests for each combustion turbine stack shall be performed within 60 days of commercial operation, as defined in Condition C.5, but no later than 180 days after initial start-up:
 - (1)** Combustion Turbines (Normal Operation - 70 percent load or outlet SCR NOx concentration of 3 ppm whichever occurs earlier) - PM, opacity, and VOC emission limits established in D.1.1(a), ~~(c)(1)~~, (d), (e)(1) and D.1.5(a)(1) shall be demonstrated for each combustion turbine at maximum load;
 - (2)** Combustion Turbines (Normal Operation - 70 percent load or outlet SCR NOx concentration of 3 ppm whichever occurs earlier) - NOx and CO emission limits of D.1.2(a)(1) and D.1.3(a) shall be demonstrated at four points in the normal operating range of each combustion turbine, including the minimum point in the range and peak load;
 - (3)** Combustion Turbines and Duct Burners (Normal Operation - 70 percent load or outlet SCR NOx concentration of 3 ppm whichever occurs earlier) - PM, PM₁₀, opacity, NOx, CO, VOC, formaldehyde and ammonia emission limits established in D.1.1(b), **(c)(1)**, (c)(2), ~~(d)~~, (e)(2), (f)(1), D.1.2(a)(2), D.1.3(b), D.1.5(a)(2), D.1.7 and D.1.8 shall be demonstrated for each combustion turbine at maximum load when its associated duct burners are in operation.
- (C)** To incorporate changes made in Minor Permit Modification No. 089-12600-00449 and to correct typographical error in the condition added in that modification, condition D.1.6 is changed as follows:

D.1.6 Emission Reduction Credits

Pursuant to 326 IAC 2-3-1(j) and 326 IAC 2-3-3(a)(5), the source must offset ozone (VOC and NO_x) emissions in accordance with the following:

- (a)** The total VOC emission offsets required as a result of this project is 90.4 tons per year. The emission reduction credits shall be obtained from shutdown of the Lubes Unit at BP Amoco Oil (089-00003). If other emission reduction credits are relied upon after issuance of this permit, this permit must be amended to identify and validate those emission reduction credits. All emission reduction credits must be validated by OAQ and creditable prior to startup of the source.
- (b)** The total NO_x emission offsets required as a result of this project is 341 tons per year. The emission reduction credits shall be obtained from shutdown of the 76"

Hot Strip Mill at Ispat Inland, Inc. (089-00316). If other emission reduction credits are relied upon after issuance of this permit, this permit must be amended to identify and validate those emission reduction credits. All emission reduction credits must be validated by OAQ and creditable prior to startup of the source.

- (c) **The total VOC emission offsets obtained from BP Amoco was 382 tons, only 90.4 tons were required for the project, leaving an excess of 291.6 tons. Pursuant to permit 089-12601-00316, 260 tons per year of VOC emission reduction credits were transferred to Ispat Inland Inc. The total NOx emission offsets obtained from Ispat Inland Inc. was 350, which was exactly the amount required. Whiting Clean Energy has a zero (0) balance of NOx and ~~36.4~~ 31.6 tons of VOC emission reduction credits available until December 2003.**
- (D) To incorporate changes made in Minor Permit Modification No. 089-15985-00449 that was issued after the draft went on public notice and to incorporate these changes in the reporting requirement, conditions D.1.2, D.1.15 and D.1.17 (now conditions D.1.16 and D.1.18 due to changes made in the response to comment 1 from Mr. Loeschner) are changed as follows:
- D.1.2 (Nitrogen Oxide)
- (d) **The Permittee may use NOx CEM data to demonstrate compliance with 40 CFR Part 60, Subpart Da, and (a) and (c) of this Section. The performance test for the NOx CEM must be taken after startup, as required under 40 CFR60.8, not during startup.**
- (e) **To demonstrate compliance with (b) of this Section, the Permittee shall use continuous fuel flowmeters following the appropriate measurement procedures specified in Appendix D to Part 75. The hourly NOx mass rate will be calculated by equation three (3) of 40 CFR60.46a (k)(2)(iv).**
- (1) **The compliance provision under 40 CFR60.46a(k)(3) requires measurement of NOx emissions at a point where emissions from the Duct Burners combine with the emissions from the Combustion Turbines, connected to a stack. This will allow measurement of NOx from the entire system.**
- (2) **The equation in Appendix D to Part 72 shall be used to calculate the actual gross electrical output, using the actual heat input instead of the maximum design heat input. The hourly emissions (lb/hr) from the NOx CEM will be divided by the actual gross electrical output to yield values in terms of the standard (lb NOx/Mwh). The performance test for the NOx CEM must be conducted after startup, as required under 40 CFR Section 60.8.**

D.1.15 16 (Natural Gas Monitoring)

~~Upon commercial operation, as defined in Condition C.5, the Permittee shall monitor the following parameters for natural gas on a calendar month basis, unless otherwise specified in 40 CFR 60.334(b), to demonstrate compliance with Operation Conditions D.1.2(b) and (f)(2), D.1.3(a), D.1.4(a) and (c), D.1.5(a) and D.1.10:~~

- (a) **The Permittee shall burn pipeline quality natural gas only. The Permittee shall demonstrate compliance with Operation Conditions D.1.4 (a) thru (c) by monitoring the natural gas per specifications in 40 CFR60.334(b) on a custom fuel monitoring schedule as follows:**

- (1) **Monitoring of the nitrogen content will not be required since pipeline natural gas is the only fuel fired in each turbine.**
- (2) **Measurement of the sulfur content of the pipeline natural gas will be conducted by manual sampling followed by analysis. Sulfur content will be determined via any of the following American Society for Testing Materials (ASTM) methods: ASTM D1072-90, ASTM D4084-94, ASTM D4468-85, ASTM D5504-94, ASTM D3246-81. The applicable ranges of some ASTM methods are not adequate to measure the levels of sulfur in some fuel gases. Dilution of samples before analysis (with verification of the dilution ratio) may be used, subject to the approval of the Administrator.**
- (3) **Initial samples must be collected and analyzed twice a month for six months. If six months of bi-monthly sampling and analysis indicate that the sulfur concentrations are well below the applicable standard with low variability, the sampling frequency will be reduced to quarterly monitoring.**
- (4) **If six quarters of quarterly sampling and analysis indicate sulfur concentrations are well below the applicable standard with low variability, the sampling frequency will be reduced to semi-annual monitoring.**
- (5) **If any analysis indicate noncompliance with the applicable sulfur limit of 0.8 weight percent in 40CFR Section 60.333(b), samples must be collected and analyzed on a weekly basis while the custom fuel monitoring schedule is re-examined. The Permittee will notify OAQ and U.S. EPA of the exceedances in accordance with 40 CFR Section 60.7(c).**
- (6) **If there is a substantial change in fuel quality, samples must be collected and analyzed on a weekly basis while the custom fuel monitoring schedule is re-examined.**
- (7) **Records of sample analyses and fuel supply information related to sulfur content of the fuel shall be retained for a least three years and shall be available for inspection upon request.**
- (b) **The Permittee shall monitor the following parameters for natural gas on a calendar month basis, unless otherwise specified in 40 CFR 60.334(b), to demonstrate compliance with Operation Conditions D.1.2(f)(2), D.1.3(a), D.1.5(a), and D.1.10:**

 - ~~(a)~~ (1) hourly natural gas flowrate to each combustion turbine and duct burner;
 - ~~(b)~~ — average sulfur content;
 - ~~(c)~~ (2) heat content;
 - ~~(d)~~ (3) natural gas fuel consumption; and
 - ~~(e)~~ — sulfur dioxide emissions rate in pounds per million Btu.

D.1.17 18 Reporting Requirement

- (d) monthly natural gas fuel usage records as required by Operation Condition D.1.1516(d 3) to demonstrate compliance with Operation Condition D.1.1(f)(2) and D.1.10; and

- (2) Written comments were received from Mr. Arthur E. Smith, Jr., from NiSource, Inc. on March 14, 2003. These comments and IDEM, OAQ responses, including changes to the permit (where language deleted is shown with strikeout and that added is shown in bold) are as follows:

Comment 1

Condition D.1.13 Hexane Limit Testing

IDEM has included a hexane limitation in Condition D.1.7 at the request of WCE to assure that the allowable emissions are less than the "major source" thresholds established for hazardous air pollutants (HAPs) both for permitting purposes and under Section 112 of the Clean Air Act. Condition D.1.13(a)(3) requires performance testing for a series of limits including formaldehyde limits established in Condition D.1.7. In addition, Condition D.1.13 requires performance testing no later than 180 days after initial start-up. Because this request is a revision to the construction permit (issued July 24, 2000), and no modifications have been made, initial start-up has already occurred and required performance testing has already been completed for all of the requirements. If a hexane test is require, the 180 days has already expired, and therefore meeting the timeframe required for testing hexane under the current language would be impossible.

If hexane testing is required, please make the following changes to allow for hexane testing within 180 days of issuance of this permit revision:

D.1.13 Performance Testing

Pursuant to ...compliance stack tests for each combustion turbine stack shall be performed within 60 days of commercial operation, as defined in Condition C.5, but no later than 180 days after initial start-up, **except for hexane stack testing which shall be performed no later than 180 days after final issuance of the significant modification 089-15716-00449 of this permit:**

Combustion ...

Combustion ...

Combustion ...VOC, formaldehyde, **hexane** and ammonia

Response 1

To add the Hexane stack testing requirement and to clarify that the testing shall be performed no later than 180 days from the issuance date of this significant modification, condition D.1.14 is changed as follows:

D.1.14 Performance Testing

- (a) Pursuant to 326 IAC 2-1.1-11, 326 IAC 2-2, 326 IAC 2-3, and 326 IAC 12, the following compliance stack tests for each combustion turbine stack shall be performed within 60 days of commercial operation, as defined in Condition C.5, but no later than 180 days after initial start-up, **except for hexane stack testing which shall be performed no later than 180 days after final issuance of the significant modification 089-15716-00449 of this permit:**

- (1) Combustion Turbines (Normal Operation - 70 percent load or outlet SCR NOx concentration of 3 ppm whichever occurs earlier) - PM, opacity, and

VOC emission limits established in D.1.1(a), (d), (e)(1) and D.1.5(a)(1) shall be demonstrated for each combustion turbine at maximum load;

- (2) Combustion Turbines (Normal Operation - 70 percent load or outlet SCR NOx concentration of 3 ppm whichever occurs earlier) - NOx and CO emission limits of D.1.2(a)(1) and D.1.3(a) shall be demonstrated at four points in the normal operating range of each combustion turbine, including the minimum point in the range and peak load;
- (3) Combustion Turbines and Duct Burners (Normal Operation - 70 percent load or outlet SCR NOx concentration of 3 ppm whichever occurs earlier) - PM, PM₁₀, opacity, NOx, CO, VOC, formaldehyde, **Hexane** and ammonia emission limits established in D.1.1(b), (c)(1), (c)(2), (e)(2), (f)(1), D.1.2(a)(2), D.1.3(b), D.1.5(a)(2), D.1.7 and D.1.8 shall be demonstrated for each combustion turbine at maximum load when its associated duct burners are in operation.

Comment 2

Conditions D.1.2, D.1.3 and D.1.13 Definition of Normal Operation

IDEM has defined "normal operation" as:

70 percent load or outlet SCR NOx concentration of 3 ppm whichever occurs earlier

WCE submits the following comments on the definition of "normal operation":

Please clarify the above language. The 70 percent load refers to the combustion turbines only and does not include the duct burners, which may or may not be turned-on during normal operation. The 70 percent combustion turbine load is at ISO conditions, which equates to 70 percent of 166 MW or equivalently 116 MW.

The 3 ppm should be clarified to 3 ppmvd. Also, a short period of time should be allowed to reach a stable 3 ppmvd condition and avoid a short transient 3 ppmvd condition that triggers normal operation. WCE suggests 5 minutes at 3 ppmvd.

WCE should be allowed to operate the facility at loads less than 70 percent if the 3 ppmvd can be maintained. The above definition of "normal operation" primarily focuses on a trigger into "normal operation." WCE does not want the condition to be interpreted later to imply that falling below 70 percent load ends "normal operation." The definition should include language that clearly allows "normal operation" to continue below 70 percent load if the 3 ppmvd can be maintained.

The above definition of "normal operation" does not clearly define what ends normal operation. From an operational standpoint, normal operation is defined as Mode 6 operation. This is supported by the 3 ppmvd NOx limit in the permit for normal operation. If the combustion turbines are in other modes, the inlet NOx concentration is normally too high for the SCR to achieve 3 ppmvd outlet NOx.

WCE suggests the following language to clarify "startup, normal operation and shutdown":

(a) A startup is defined as the operation in the period of time from the initiation of combustion until the turbine reaches a minimum load of seventy (70) percent at ISO conditions (116 MW) or outlet SCR NOx concentration reaches level less than 3.0 ppmvd at 15% O2 for a period of 5 minutes whichever occurs earlier.

A shutdown is defined as a NOx concentration greater than 3.0 ppmvd at 15% O2 and descent to flame-out conditions.

Response 2

To make the permit more consistent with other permits issued for similar operations, IDEM, OAQ will delete the definition of normal operation from conditions D.1.2 and D.1.3 but add the definition of startup and shutdown in the startup and shutdown limitation condition.

IDEM, OAQ agrees that the conditions are not very clear and need to be revised in order to remove any confusion in future interpretations. IDEM, OAQ doesn't define the conditions at which the 100 percent load should be measured at or the output in terms of Megawatts at these conditions. IDEM's intention when such conditions are included in similar permits is that the 100 percent load will be measured by the source at the annual average temperature, pressure and humidity in the location where the plant is located. The measured 100 percent load will be the basis for measuring any percent load defining the startup and shutdown conditions.

Defining shutdown condition on the basis of 'when 3 ppm NO_x emission rate is exceeded' does allow the Permittee a large window to specify instantaneous 3 ppm exceedance to flameout as part of shutdown. To minimize the variability in such scenarios, IDEM established the shutdown period as from the instance the turbine load falls below the 50% load when finally descending to flame out. This minimizes the operation during non-steady state for these turbines.

Therefore, conditions D.1.2, D.1.3, D.1.9 and D.1.14 are changed as follows:

D.1.2 Nitrogen Oxides (NO_x) Emission Limitations

- (a) Pursuant to 326 IAC 2-2 (PSD Requirements) and 326 IAC 2-3 (Emission Offset Requirements), each combustion turbine/steam generating unit shall comply with the following, excluding the startup and shutdown periods:
 - (1) During normal operation (~~70 percent load or outlet SCR NO_x concentration of 3 ppm whichever occurs earlier~~), the NO_x emissions from each combustion turbine stack shall not exceed 3.0 ppmvd at 15 percent oxygen, based on a 3-hour rolling average, which is equivalent to 19.5 pounds NO_x per hour at ISO conditions.
 - (2) During normal operation (~~70 percent load or outlet SCR NO_x concentration of 3 ppm whichever occurs earlier~~), the NO_x emissions from each combustion turbine stack, when its associated duct burner is operating, shall not exceed 3.0 ppmvd at 15 percent oxygen, based on a 3-hour rolling average, which is equivalent to 38.0 pounds NO_x per hour at ISO conditions.

D.1.3 Carbon Monoxide (CO) Emission Limitations

Pursuant to 326 IAC 2-2 (PSD Requirements), each steam generating unit shall comply with the following, excluding startup and shutdown periods:

- (a) During normal operation (~~70 percent load or outlet SCR NO_x concentration of 3 ppm whichever occurs earlier~~), the CO emissions from each combustion turbine stack shall not exceed 0.016 pounds per MMBtu, which is equivalent to 28.0 pounds CO per hour.
- (b) During normal operation (~~70 percent load or outlet SCR NO_x concentration of 3 ppm whichever occurs earlier~~), the CO emissions from each combustion turbine stack, when its associated duct burner is operating, shall not exceed 0.037 pounds per MMBtu, which is equivalent to 93.7 pounds CO per hour.

D.1.9 Startup and shutdown limitations

Pursuant to 326 IAC 2-2 (PSD Requirements) each combustion turbine shall comply with the following:

- (a) A startup is defined as the operation in the period of time from the initiation of combustion until the turbine reaches a minimum load of seventy (70) percent or instantaneous outlet SCR NO_x concentration reaches a level less than of 3 ppmvd at 15% O₂ for a period of 5 minutes whichever occurs earlier.**
- (b) A Shutdown is defined as operation at less than fifty (50) percent load descending to flame out.**
- ~~(a)~~ **(c)** A Startup or shutdown period shall not exceed four (4) hours. Each turbine shall not exceed 473 hours per year for startups and 260 hours per year for shutdowns.
- ~~(b)~~ **(d)** The NO_x emissions from each combustion turbine stack shall not exceed 510 pounds per startup and 49 pounds per shutdown. Each combustion turbine shall not exceed 41.5 tons per year of startup and shutdown emissions.
- ~~(e)~~ **(e)** The CO emissions from each combustion turbine stack shall not exceed 1,571 pounds per startup, and 220 pounds per shutdown. Each combustion turbine shall not exceed 168.7 tons per year of startup and shutdown emissions.

D.1.14 Performance Testing

- (a) Pursuant to 326 IAC 2-1.1-11, 326 IAC 2-2, 326 IAC 2-3, and 326 IAC 12, the following compliance stack tests for each combustion turbine stack shall be performed within 60 days of commercial operation, as defined in Condition C.5, but no later than 180 days after initial start-up, except for hexane stack testing which shall be performed no later than 180 days after final issuance of the significant modification 089-15716-00449 of this permit:
 - (1) Combustion Turbines (Normal Operation ~~~70 percent load or outlet SCR NO_x concentration of 3 ppm whichever occurs earlier~~) - PM, opacity, and VOC emission limits established in D.1.1(a), (d), (e)(1) and D.1.5(a)(1) shall be demonstrated for each combustion turbine at maximum load;
 - (2) Combustion Turbines (Normal Operation ~~~70 percent load or outlet SCR NO_x concentration of 3 ppm whichever occurs earlier~~) - NO_x and CO emission limits of D.1.2(a)(1) and D.1.3(a) shall be demonstrated at four points in the normal operating range of each combustion turbine, including the minimum point in the range and peak load;
 - (3) Combustion Turbines and Duct Burners (Normal Operation ~~~70 percent load or outlet SCR NO_x concentration of 3 ppm whichever occurs earlier~~) - PM, PM₁₀, opacity, NO_x, CO, VOC, formaldehyde, Hexane and ammonia emission limits established in D.1.1(b), (c)(1), (c)(2), (e)(2), (f)(1), D.1.2(a)(2), D.1.3(b), D.1.5(a)(2), D.1.7 and D.1.8 shall be demonstrated for each combustion turbine at maximum load when its associated duct burners are in operation.

Comment 3

Condition D.1.9(c) Demonstrating Compliance with CO Startup/Shutdown requirements

A CO CEM or CO parametric monitoring should be allowed to demonstrate compliance with the startup and shutdown CO limits in Condition D.1.9(c).

D.1.14 Continuous Emission Monitoring

Pursuant to 326 IAC 2-2...

- (1) nitrogen oxide concentration; and
- (2) oxygen concentration; and
- (3) carbon monoxide concentration or a parametric monitoring plan approved by the Administrator for purposes of demonstrating compliance with Condition D.1.9(c). Compliance with this monitoring condition D.1.14(a)(3) is required within 180 days from issuance of this modification.

Response 3

IDEM will require the source to install a CO CEM to be consistent with permits issued to similar operations. To add the CO CEM requirement and to clarify that compliance with this requirement shall be achieved no later than 180 days from the issuance date of this significant modification, conditions D.1.14, D.1.15 and D.1.18 are changed as follows:

D.1.14 Performance Testing

- (b) Pursuant to 326 IAC 3-5, the Permittee shall conduct performance tests on each combustion turbine stack to certify the continuous emission monitoring (CEM) systems for NOx **and CO**.

D.1.15 Continuous Emission Monitoring

- (a) Pursuant to 326 IAC 2-2, 326 IAC 2-3, 326 IAC 3-5, and 326 IAC 12, the Permittee shall continuously monitor and record the following parameters from each combustion turbine stack to demonstrate compliance with the limitations and operation standards required by Operation Conditions D.1.2, **D.1.3 and D.1.9:**

(1) nitrogen oxide concentration; and

(2) oxygen concentration.

(3) carbon monoxide concentration.

- (b) The continuous monitoring systems shall be installed and operational prior to conducting the performance tests. A monitoring protocol shall be performed in accordance with the applicable procedures under 40 CFR 60, Appendix B, Performance Specification 1 and 326 IAC 3-5 and shall be submitted to:

Indiana Department of Environmental Management
Compliance Data Section, Office of Air Management
100 North Senate Avenue, P. O. Box 6015
Indianapolis, Indiana 46206-6015

within 60 days of commercial operation, as defined in Condition C.5, but no later than 180 days after initial startup. Verification of operational status shall, as a minimum, include completion of the manufacturer written requirements or recommendations for installation, operation, and calibration of the device.

Compliance with monitoring condition D.1.15(a)(3) is required within 180 days from issuance of this modification.

D.1.18 Reporting Requirement

The Permittee shall submit the following information on a quarterly basis:

- (a) records of excess NOx emissions (defined in 326 IAC 3-5-7) from the continuous emissions monitoring system for each parameter described in Operation Condition D.1.15 to demonstrate compliance with Operation Condition D.1.2;

- (b) records of excess CO emissions (defined in 326 IAC 3-5-7) from the continuous emissions monitoring system for each parameter described in Operation Condition D.1.15 to demonstrate compliance with Operation Condition D.1.3;**
- ~~(b)~~ **(c)** records of excess SO₂ emissions (defined in 40 CFR 60.334(c)(2)) for the parameter described in Operation Condition D.1.15(b) to demonstrate compliance with Operation Condition D.1.4(b);
- ~~(c)~~ **(d)** monthly natural gas fuel usage records as required by Operation Condition D.1.16(d) to demonstrate compliance with Operation Condition D.1.1(f)(2) and D.1.10; and
- ~~(d)~~ **(e)** daily records of the startup and shutdown NO_x and CO emission records as required by Operation Condition D.1.9 to demonstrate compliance with PSD Requirements pursuant to 326 IAC 2-2.

Comment 4

Quarterly Report Form

A new quarterly report form has been added to report startup and shutdown information. The information required to be reported is unclear. Also, the stated limit on the form does not concur with the limits in the permit (Condition D.1.9). The limit stated on the form is:

Limit: 240 startup/shutdown per twelve month period (Startup or shutdown shall not exceed 4 hours)

This is not correct in that the number of startups and shutdowns allowed per year is dependent on the length of each startup and shutdown.

This form should be deleted or modified to require the reporting of information that is consistent with Condition D.1.9.

Response 4

To clarify the compliance and reporting requirements of the Startup and Shutdown limitation, condition D.1.9, D.1.18 and the Startup and Shutdown reporting form are changed as follows:

D.1.9 Startup and shutdown limitations

Pursuant to 326 IAC 2-2 (PSD Requirements) each combustion turbine shall comply with the following:

- (a) A Startup or shutdown period shall not exceed four (4) hours. Each turbine shall not exceed 473 hours per year for startups and 260 hours per year for shutdowns **with compliance demonstrated at the end of each month.**

D.1.18 Reporting Requirement

The Permittee shall submit the following information on a quarterly basis:

- (e) ~~daily records of the startup and shutdown NOx and CO emission records as required by Operation Condition D.1.9 to demonstrate compliance with PSD Requirements pursuant to 326 IAC 2-2.~~ **A quarterly summary of the information to document compliance with Condition D.1.9(a) shall be submitted to the addresses listed in Section C - General Reporting Requirements, of this permit, using the reporting forms located at the end of this permit, or their equivalent, within thirty (30) days after the end of the quarter being reported.**

**Indiana Department of Environmental Management
Office of Air Quality
Compliance Data Section
Quarterly Report**

Company Name: Whiting Clean Energy, Inc.
Location: 2155 Standard Avenue, Whiting, Indiana 46394
Permit No.: CP 089-11194-00449
Source/Facility: Two (2) Combustion Turbines, **please copy and use separate form for each turbine**
Limits: ~~240 startup/shutdown~~ **473 hours for startups and 260 hours for shutdowns per twelve month period with compliance demonstrated at the end of each month** (startup or shutdown shall not exceed 4 hours)

Month Turbine ID: _____ Year: _____

Day / Turbine #	1	2	Day / Turbine #	1	2
1			17		
2			18		
3			19		
4			20		
5			21		
6			22		
7			23		
8			24		
9			25		
10			26		
11			27		
12			28		
13			29		
14			30		
15			31		
16			No. of Deviation		

Month	Column 1 Hours during this month		Column 2 Hours during previous 11 months		Column 3 Hours during 12 month period	
	Startup	Shutdown	Startup	Shutdown	Startup	Shutdown

- (3) Written comments were received from Mr. Stephen A. Loeschner on March 10, 2003. These comments and IDEM, OAQ responses, including changes to the permit (where language deleted is shown with strikethrough and that added is shown in bold) are as follows:

Comment 1

11194 VOC LAER

DEM devoted most of pp. 9 - 12 of its 19-page 11194 BACT/LAER analysis to VOC LAER, and it reached an incredulous erroneous conclusion. DEM allowed 11194 Condition D.1.5(a)(2) 4.6 pounds VOC per billion Btu of operation with no oxidation catalyst. It is precisely then; when the duct burners are operating-when the system is at maximum, when the exhaust is hottest, when the rate of fuel expenditure is greatest-it is then and there where a catalyst should be placed where the catalyst will be near its upper heat range so as to destroy the greatest amount of VOC possible. But, in 11194, no catalyst was required. That was (is) clear error.

There is no discussion or permit condition within 11194 controlling VOC during the startup and shutdown portions of operation. That was (is) clear error.
What is VOC?

A very technical view of 150+ specific VOC's is codified as the Maximum Incremental Reactivities Table of Appendix XVIII to 40 CFR 86 ("MIR"). The 40 CFR 51.100(s) definition is rather unclear, as among other things, it fails to tell how high of a boiling point a compound can have and yet still be a VOC. One thing that is clear from MIR is that many products of incomplete combustion ("PIC"), such as formaldehyde and acetaldehyde, are VOC. More expected are the non-combusted hydrocarbons ("HC") like propane. CO is a PIC, and it is explicitly listed is not being a regulated 40 CFR 51.100(s) VOC.

15716 startup/shutdown time amendment

11194 Condition D.1.2(a)(3) "The startup or shutdown period shall not exceed two (2) hours." and 11194 Condition D.1.3(a)(3) "The startup or shutdown period shall not exceed two (2) hours." obligate that the startup and shutdown portions of operation are to be minimized. 15716 would relax that to four hours. There appears within 15716 no explanation whatsoever of that doubling of time gift to polluter Whiting. That relaxation must be viewed as environmentally detrimental, for it is these operating portions where very little electrical energy and or process steam are being created, and yet, on a pounds pollutant per fuel unit basis, the emission rate is very high. It is environmentally beneficial to minimize the time of the individual startup and shutdown periods. It is overtly environmentally destructive to lengthen those individual periods. There must be no relaxation of those 11194 condition statements.

15716 startup/shutdown concentration amendment

By 15716, DEM proposes to delete the 11194 NO_x Condition D.1.2(a)(3) 70 parts per million by volume on a dry basis @ 15% diatomic molecular oxygen ("O₂") (standardized, "ppms") and 11194 CO Condition D.1.3(a)(3) 110 ppms concentration limits. On p. 3 of the 15716 TSD DEM offers:

"DEM, Office of Air Quality decided that the startup performance testing is not reliable because of the high variability of the flow conditions and instead will require the Permittee to maintain

Continuous Emission Monitoring systems data to show compliance with startup and shutdown limits."

That is most curious, for the "high variability of the flow" will cause identical or greater measurement errors and uncertainties with CEM's than with presumably more sophisticated temporary emission monitoring equipment systems. In the vernacular, one does not certify the accuracy of the inch marks on a typical elementary school foot-ruler by using another typical elementary school foot-ruler-something distinctively better would be used.

A foundation of a typical CEM is a "cell" through which the stack gas to be analyzed is passed in which there is a light source and a light detector which performs a spectrographic adsorption analysis that is sensitive to one or more specific target gasses. The result is to provide a quite linear indication of how much (mass) of a target gas is in the cell. It is thus pressure and temperature sensitive, in that, for example, a concentration of 11.0 ppmv target gas at a pressure of 19.8 pounds per square inch absolute ("psia") will give an identical indication as a concentration of 12.1 ppmv target gas at a pressure of 18.0 psia if both are at the same temperature. Also, a concentration of 13.0 ppmv target gas at a temperature of 400 Kelvin will give an identical indication as a concentration of 14.3 ppmv target gas at a temperature of 440 Kelvin if both are at the same pressure. Measuring the cell psia and target gas temperature and compensating the reading for their variation is fairly easy. It is also fairly easy to assure that the volumetric composition of the gas in the cell is representative of the volumetric composition of the gas in the stack being monitored. At this point, with an assumption of the average molecular weight of the stack gas, it is possible to know what the raw volumetric concentration of the target gas is within the stack gas. By repeating the technique for several gasses, such as water, and O₂ or carbon dioxide, a standardized value of ####.## ppms concentration can be presented. All of this can be accomplished in seconds, such that in a 2-hour period, 1,200 scientifically valid standardized concentration values can be recorded.

Thus, obtaining concentration data over the startup and shutdown interval, noting the highest valid value, and comparing it against the existing 11194 Conditions D.1.2(a)(3) and D.1.3(a)(3) is rather easy as there is no need to quantify a volumetric or mass flow rate and no need to accumulate those into a specific volume or specific mass.

Much more complicated is the matter of obtaining a unit volume flow per unit time or a unit mass per unit time and then integrating it over time so as to have the accumulated mass emission of a startup or shutdown event. There must be no relaxation of those 11194 condition statements.

Cumulative effect of proposed 15716 amendments

While providing no technical mathematical basis whatsoever, DEM offers on p. 3 of the 15716 TSD:

"This requested change will not affect allowable emissions during startup/shutdowns on an annual basis."

Whiting is presently subject to rolling 12 consecutive month total limits of 571 tons CO and 262 tons NO_x by 11194 Condition D.1.9. With 15716, DEM proposes to remove those limits.

Here is a 15716 *not worst-case* possibility: Whiting operates for 5,000 hours emitting $5,000 \times 5,112 \times 0.037 / 2,000 = 472.9$ t CO (15716 Condition D.1.3(a)(2)) and emitting $5,000 \times 76 / 2,000 = 190.0$ t NO_x (15716 Condition D.1.2(a)(2)). Whiting operates for 2,000 hours emitting $2,000 \times 3,470 \times 0.016 / 2,000 = 55.5$ t CO (15716 Condition D.1.3(a)(1)) and emitting $2,000 \times 39 / 2,000 = 39.0$ t NO_x (15716 Condition D.1.2(a)(1)). Whiting is starting, stopping, or not operating for a total of 1,760 hours emitting 168.7 t CO (15716 Condition D.1.9(c)) and emitting 41.5 t NO_x (15716 Condition D.1.9(b)).

Thus, 15716 would permit at least 697.1 tpy CO and at least 270.5 tpy NO_x-both more than the existing 11194 permit-and, most importantly, it would serve well in obfuscating from the public what the maximum permitted annual totals are. This cannot be considered as error; it must be considered as DEM's willful intent.

Combustion conditions and permit limits that generate and allow a greater emission of a specific PIC tend to generate and allow greater emissions of PIC as a class. Thus, an additional cumulative 15716 effect is that as a greater amount of PIC CO is permitted, so too is a greater amount of PIC VOC. The same physical and administrative processes that foster PIC VOC foster unburned HC fuel component VOC.

Response 1

In its public notice, IDEM stated that any comments from the public should be related and limited to this modification only. Therefore, comments regarding the 11194 VOC LAER will not be addressed in this response.

In response to the commentator's comment regarding the startup and shutdown time and concentration amendment, Whiting explanation for their request for these amendments was as follows:

Based on the current vendor procedures and experience to date, the startup and shutdown conditions for NOx and CO requires equipment to operate in a higher stress regime which over time could accelerate degradation of the facility reliability. It appears that the July 20, 2000 startup and shutdown conditions were incorporated in the permit without the benefit of a large base of actual operational data for similar operation. The resulting limits are much more stringent than startup and shutdown BACT.

IDEM, OAQ agrees with the source's comment that this permit was issued at time when limited information was available about the NOx and CO startup and shutdown emissions from the combustion turbines. In recent discussions with sources operating similar facilities and review of actual information related to compliance monitoring in the field, it was observed that the compliance with concentration based limits for NOx and CO during startup and shutdown is difficult. The difficulty is caused by the variability in the flow rate and the pollutant concentrations during these time periods. The pollutant concentrations vary significantly as the turbines are ramped up. A large spike in the concentration during the initial stage can potentially result in non-compliance with the limit even though the actual emissions were quite low, when the data points are averaged over the entire duration. Also, there are limited options (other than shutting down the turbine and go through a restart) that the Permittee can exercise to reduce the pollutant concentration subsequent to the spike to average out the emissions over the startup period. This would be overly restrictive and undesirable operation for the turbine and is environmentally detrimental in terms of waste of resources. On the other hand during lower load within the startup, the pollutant concentration could be quite high but due to low exhaust gas flow rate, the actual mass emissions would be low. Therefore, IDEM, OAQ established that the best approach is to aggregate the total mass of emissions over the entire startup period and limit it as part of the BACT determination. This gives the Permittee the flexibility to startup even if it faces tripping or spiking during startup and also minimizes the total mass emissions during the period to protect the air quality in the region. In addition, IDEM, OAQ has determined the following:

1. The proposed time and emission limits are consistent with the most comprehensive and overall stringent startup and shutdown requirements including limits that were identified for Duke Energy Vigo in Indiana that was approved on June 16, 2001.
2. These limitations are more elaborate than limitations proposed for similar resources located in other states.

IDEM, OAQ agrees with the commentator that the deletion of the old condition D.1.9 might be interpreted as a permission to increase the allowable emission from the whole source which was not the intend of this permit. Therefore, the Annual Emission Limitation, the reporting requirement and the reporting form will be re-instated in the permit as follows. All conditions following the new added condition were renumbered to reflect the addition of the new condition as follows:

D.1.10 Annual Emission Limitations

Pursuant to 326 IAC 2-2 (PSD Requirements) and 326 IAC 2-3 (Emission Offset Requirements), the annual source emissions, including startup and shutdown operations, shall not exceed 262 tons of NOx per year and 571 tons of CO per year, based on a 12 consecutive month period.

D.1.17 Reporting Requirement

The Permittee shall submit the following information on a quarterly basis:

- (f) **daily records of the annual NOx and CO emission records as required by Operation Condition D.1.10 to demonstrate compliance with Operation Condition D.1.6 and PSD and Emission Offset Requirements pursuant to 326 IAC 2-2 and 326 IAC 2-3, respectively.**

**Indiana Department of Environmental Management
Office of Air Quality
Compliance Data Section
Quarterly Report**

Company Name: Whiting Clean Energy, Inc.
Location: 2155 Standard Avenue, Whiting, Indiana 46394
Permit No.: CP 089-11194-00449
Source/Facility: Combustion Turbines and Duct Burners
Limits: 262 tons NOx per year, based on a 12 consecutive month period and
571 tons CO per year, based on a 12 consecutive month period

YEAR:

Month	Facility*	Pollutant	Emissions this Month, tons	Annual Emissions Last 12 Months, tons	Emission Limit, tons/12 consecutive month period
	Combustion Turbines and Duct Burners	NOx			262
		CO			571
	Combustion Turbines and Duct Burners	NOx			262
		CO			571
	Combustion Turbines and Duct Burners	NOx			262
		CO			571

* This limitation includes startup, shutdown and normal operations. Emissions from startup and shutdown operations shall be determined by multiplying the ppm data collected from a compliance stack test or CEM system by the maximum theoretical flow rate for startup and shutdown operations.

Submitted by: _____

Title / Position: _____

Signature: _____

Date: _____

Phone: _____

Comment 2

"Hexane"

What is "15716 hexane?" Is it exclusively *n*-hexane; a mixture of *n*-hexane, 2,2-dimethylbutane, 2,3-dimethylbutane, 2-methylpentane and 3-methylpentane; or, is it something else? Cleverly, DEM adds a "hexane" limit within 15716 Condition D.1.7, but requires no test measurement. Precisely why does DEM propose to clutter the permit with "hexane" when EPA has stated that formaldehyde typically amounts to about 2/3 of the 42 USC 7412 Hazardous Air Pollutant ("HAP") from 40 CFR 72.2 "natural gas" fired turbines (and presumably duct burners)? What technical reason does DEM and or Whiting have to disagree with the EPA formaldehyde HAP opinion?

Describe with great technical detail the circumstance by which Whiting could emit a greater quantity of HAP *n*-hexane than it does HAP acetaldehyde.

Describe with great technical clarity why Whiting "requested" an individual *n*-hexane limit rather than an individual acetaldehyde limit.

Neither 11194 nor 15716 clearly define or restrict the Whiting fuel. Whiting is located near an oil refinery. Refineries may produce "light ends" from time to time in places, quantities, and concentrations, where, rather than refine them further for salable product, it is more economical to simply combust them on-site as a process steam generating fuel. It would appear from the cumulative restraints of 11194 and 15716, that nothing would prohibit Whiting from mixing refinery "light ends" into its normal turbine and duct burner fuel.

When a fuel of a given molecular form is combusted, e.g. a HC mix like 85% methane, 11% ethane, 2% propane, and 2% other matter that is not limited to being HC, there will be a certain amount of HC in the stack emission. Not surprisingly, the dominant emitted (non-combusted) HC will be methane-as, in an environment where O₂ is readily available, the probability of non-*n*-hexane fuel constituents being reassembled by combustion into *n*-hexane is rather small. The only reasonable conclusion as to why Whiting has a "hexane" concern would be that they want to burn (and or are burning) a fuel that has a statistically high amount of *n*-hexane in it.

Describe with great specificity Whiting's historical and projected fuel sources and chemistries including results of all fuel analysis for *n*-hexane.

Response 2

In permit 089-11194-00449, the California Air Toxic Emission Factors (CATEF) version 1.2, June 1998 Hexane factor for NG was applied to the combustion turbines and the AP-42 emission factor was applied for the duct burners at Whiting. These emission factors have shown that the Hexane potential to emit are 11.1 tons per year. Whiting believes that these emission factors have been shown to be overstated for natural gas combustion in turbines and duct burners. The 11.1 tons per year potential to emit defines WCE as a major source of HAPs and has Clean Air Act 122 (j) implications. Therefore, WCE requested the addition of a Hexane limit to the permit to limit the emissions below the major source thresholds for HAPs. In addition, the Hexane stack testing was added pursuant to comment 1 from the source.

Regarding the fuel used at the source, Whiting Clean energy is approved to use natural gas as the only fuel source and required to report the fuel usage monthly. Whiting Clean Energy will be in violation of the requirements of the condition of the construction permit if it uses any fuel other than natural gas.

Comment 3

50 - 70% operating range

During a startup with intent to achieve something near 100% operation, 11194 Condition D.1.2(a)(1) limits NO_x concentration to 3 ppms averaged over 3 hours when operating at 50% or greater. Whiting has the privilege of emitting any amount of NO_x at 51%, as the 11194 Condition D.1.2(a)(3) 70 ppms maximum limit is inapplicable, so long as the concentration measurements for the first, through the last within the 3-hour period, where the first measurement included in the average is the first recorded when the power first was at 50% or more, average no more than 3 ppms.

During its operating history, how many times has Whiting violated 11194 Condition D.1.2(a)(1)? If there were violations: 1) How many of those times were during times of startup with intent to achieve operation near 100% for the 3-hour period that began when 50% power was achieved? 2) Why has there been no enforcement? 3) When will there be enforcement?

During a startup with intent to achieve something near 100% operation, 11194 Condition D.1.3(a)(1) limits CO to 16 pounds per billion Btu heat input when operating at 50% or greater. Whiting has the privilege of emitting any concentration of CO at 51%, as the 11194 Condition D.1.3(a)(3) 110 ppms maximum limit is inapplicable, so long as the 16 pound CO per billion Btu rate is not exceeded.

During its operating history, how many times has Whiting violated 11194 Condition D.1.3(a)(1)? If there were violations: 1) How many of those times were during times of startup with intent to achieve operation near 100% for the 3-hour period that began when 50% power was achieved? 2) Why has there been no enforcement? 3) When will there be enforcement?

Response 3

Whiting Clean Energy was required to submit records of excess NOx emissions from the NOx CEMS to demonstrate compliance with condition D.1.2. The reports are due within 30 days for the end of the quarter. In order for IDEM to consider the CEMS data reliable the CEMS need to be certified first. The NOx CEMS at Whiting was certified on October 03, 2002 and the first quarterly report after the certification was received by IDEM on January 30, 2003 and stated that there was no operation of the units during the fourth quarter and because of that no 3-hour average data was submitted. The first quarterly report of 2004 is not due until the end of April 2004 and has not been received as of now.

Since Whiting Clean Energy was not required to install a CO CEMS, It had to rely on stack tests to show compliance with the emission limits stated in condition D.1.3. As explained in the next condition, the stack tests have been conducted but the results have not been finalized and approved as of now.

Therefore, as of now there have been no reported violations of condition D.1.2 and condition D.1.3.

Comment 4

CO CEMS

Are there now or have there been CO CEMS functional on one or more of the Whiting stacks? Was 11194 Condition D.1.3(a)(3) data gathered? What was the highest CO ppms recorded? What is DEM's posture in re the absence of CO CEMS requirement in 11194? In 15716? Describe (prove) in great technical detail how the 15716 Condition D.1.16 can in any way provide 40 CFR 52.21(b)(17) federal enforceability.

Provide a multiple line 5-data field per line (date, turbine, power, highest ### pounds CO per billion Btu, average ### pounds CO per billion Btu) data table (which, as there are 2 turbines, there must be at least 8 lines) for all of the 11194 Condition D.1.13(a)(2) tests that have been performed

Response 4

Permit 11194 didn't require the source to have a CO CEM and neither did draft permit 15716 but this requirement was added to the permit in the response to comment 3 from the source.

Stack tests were performed at the source but these results have not been finalized and approved as of now and the commentator may contact the Compliance Data Section to request copies of the raw results.

Comment 5

Text interpretation

In 15716 Conditions D.1.2(a)(1), (a)(2), D.1.3(a)(1), and (a)(2), DEM has placed the text: "During normal operation (70 percent load or outlet SCR NO_x concentration of 3 ppm whichever

occurs earlier)"

And DEM has placed similar text in 15716 Conditions D.1.13(a)(1) - (a)(3).

What is of note is the rather clear possibility that during startup, following ignition, at a power level less than 50%, there will occur an outlet SCR NO_x concentration of 3 ppm. DEM has the options of rewriting the text and having the whole matter then be ripe for appeal, even by persons who did not comment, or DEM may chose to simply plod ahead and then later declare that some typographic error has been made and that it feels entitled to make an administrative correction and deny appeal rights.

Response 5

The mentioned conditions were changed as described in the response to comment 2 from the source. Therefore, this comment will not be addressed any further.

Comment 6

Duct burner operation

11194 Condition D.1.2(a)(3) states: "The duct burners shall not be operated until normal operation begins." With that limitation absent from 15716, a new operating condition is allowed (operation of duct burners prior to normal turbine operation) in which there is no bound on CO pounds per billion Btu, CO ppms, NO_x pounds per billion Btu, or NO_x ppms. This is a deterioration of CO BACT and NO_x LAER. It is clearly an abuse of discretion.

Response 6

IDEM, OAQ agrees with the commentator and conditions D.1.2 and D.1.3 are changed as follows. All conditions following the new added conditions were renumbered to reflect the addition of the new conditions:

D.1.2 Nitrogen Oxides (NO_x) Emission Limitations

- (a) Pursuant to 326 IAC 2-2 (PSD Requirements) and 326 IAC 2-3 (Emission Offset Requirements), each combustion turbine/steam generating unit shall comply with the following, excluding the startup and shutdown periods:
 - (1) During normal operation, the NO_x emissions from each combustion turbine stack shall not exceed 3.0 ppmvd at 15 percent oxygen, based on a 3-hour rolling average, which is equivalent to 19.5 pounds NO_x per hour at ISO conditions.
 - (2) During normal operation, the NO_x emissions from each combustion turbine stack, when its associated duct burner is operating, shall not exceed 3.0 ppmvd at 15 percent oxygen, based on a 3-hour rolling average, which is equivalent to 38.0 pounds NO_x per hour at ISO conditions.
 - (3) **The duct burners shall not be operated until normal operation begins.**

D.1.3 Carbon Monoxide (CO) Emission Limitations

Pursuant to 326 IAC 2-2 (PSD Requirements), each steam generating unit shall comply with the following, excluding startup and shutdown periods:

- (a) During normal operation, the CO emissions from each combustion turbine stack shall not exceed 0.016 pounds per MMBtu, which is equivalent to 28.0 pounds CO per hour.
- (b) During normal operation the CO emissions from each combustion turbine stack, when its associated duct burner is operating, shall not exceed 0.037 pounds per MMBtu, which is equivalent to 93.7 pounds CO per hour.

- (c) Good combustion practices shall be applied to minimize CO emissions
- (d) **The duct burners shall not be operated until normal operation begins.**

Comment 7

Enforcement

Permit drafts for new and modified sources have traditionally included an enforcement section within the TSD-often with a single statement to the effect that there are no enforcement issues. Is the absence of such a section within 15716 the beginning of a new trend?

Response 7

The absence of the Enforcement Issue section within the tsd was an error and is not a new trend. IDEM, OAQ, prefers that the Technical Support Document (TSD) reflect the permit that was on public notice. Changes to the permit or technical support material that occur after the public notice are documented in this Addendum to the Technical Support Document. This accomplishes the desired result of ensuring that these types of concerns are documented and part of the record regarding this permit decision. Therefore, this TSD addendum acknowledges the following change, however the TSD is not changed, as follows:

Enforcement Issue

There are no enforcement actions pending.

Comment 8

Error

The 15716 p. 9 TSD reference to 167-15295-00123 seems out of place.

Response 8

This TSD addendum acknowledges the following change, however the TSD is not changed, as follows:

Conclusion

The construction of this proposed modification shall be subject to the conditions of the attached proposed Significant Modification No. ~~167-15295-00123~~ **089-15716-00449**.

Comment 9

Hardship

There appears nowhere within the 15716 TSD or elsewhere within 15716 any clear reason or basis of why Whiting is requesting the amendments.

Is Whiting alleging a hardship in being obligated to perform starts in no more than 2 hours? Are they alleging that they cannot accomplish that? What is their technical foundation in re their inability?

Is Whiting alleging a hardship in being obligated to not emit more than a 3.0 ppms NO_x concentration and not more than 16 pounds CO per billion Btu input while operating in the range of 50 - 69.99% power? Are they alleging that they cannot accomplish that? What is their technical foundation in re their inability?

Is Whiting alleging a hardship in being obligated to not emit more than a 70 ppms NO_x concentration and not more than a 110 ppms CO concentration during startup? Are they alleging that they cannot accomplish that? What is their technical foundation in re their inability?

Is Whiting alleging a hardship in being obligated to not emit more than 571 tons CO and 262 tons NO_x in any consecutive 12 months? Obviously, as they need only curtail some operation, *they cannot allege an inability to accomplish that*. What is their technical and economic foundation in re their alleged hardship?

As LAER is non-economic, only physical "we cannot do's as proven by ..." are acceptable for permit amendments permitting greater emissions. In 15716, there is no "we cannot do, as proven

by," thus the proposed 15716 amendments are clear error and writing them for public review, rather than a summary rejection and return to the applicant, is an abuse of discretion that drains the public resource.

Response 9

Issues raised by this comment were addressed in the response to comment 1.

Comment 10

URL's

Provide all of the GE URL's that were used to found the 15716 p. 2 TSD text.

Response 10

The URL for the GE document used in the TSD for the draft permit is:

http://www.gepower.com/dhtml/publications/en_us/index.jsp/

Indiana Department of Environmental Management Office of Air Quality

Technical Support Document (TSD) for a Significant Modification to a Construction and PSD Permit.

Source Background and Description

Source Name:	Whiting Clean Energy, Inc.
Source Location:	2155 Standard Avenue, Whiting, Indiana 46394
County:	Lake
SIC Code:	4911
Operation Permit No.:	CP-089-11194-00449
Operation Permit Issuance Date:	July 20, 2000
Significant Modification No.:	089-15716-00449
Permit Reviewer:	Ghassan Shalabi

The Office of Air Quality (OAQ) has reviewed a modification application from Whiting Clean Energy, Inc. relating to the following:

- (1) Revision to the definition of a "normal operation".
- (2) Revision to the startup and shutdown limitations for NO_x and CO.
- (3) Addition of a Hexane limitation.

Recommendation

The staff recommends to the Commissioner that the Significant Modification be approved. This recommendation is based on the following facts and conditions:

Unless otherwise stated, information used in this review was derived from the application and additional information submitted by the applicant.

Applications for the purposes of this review were received on June 07, 2002.

Justification for Modification

The Operating permit is being modified through 326 IAC 2-2 and IC 13-15-7-1 because PSD limits are being revised. Therefore, this modification will be subject to public notice and will have 30 day public comment period.

County Attainment Status

The source is located in Lake County.

Pollutant	Status
PM-10	Moderate non-attainment
SO ₂	Primary non-attainment
NO ₂	Attainment or unclassified
Ozone	Severe non-attainment
CO	attainment or unclassified

Volatile organic compounds (VOC) are precursors for the formation of ozone. Therefore, VOC emissions are considered when evaluating the rule applicability relating to the ozone standards. Lake County has been designated as nonattainment for ozone.

Source Status

This existing source is a major stationary source because an attainment regulated pollutant is emitted at a rate of 100 tons per year or more, and it is one of the 28 listed source categories. The source was issued a PSD construction permit 089-11194-00449 on May 09, 2001.

Federal Rule Applicability

- (a) There are no New Source Performance Standards (NSPS)(326 IAC 12 and 40 CFR Part 60) applicable to this source.
- (b) There are no National Emission Standards for Hazardous Air Pollutants (NESHAPs)(326 IAC 14 and 40 CFR Part 63) applicable to this source.

Proposed Permit Changes

- (a) The permittee has requested the revision of the definition of startup and shutdown.

The permittee presented their request based on the following argument:
The permit defines the normal operation as 50 percent load or more. This definition is somewhat arbitrary because the "50 percent load" is dependent on operating and ambient conditions. Normal operation is a function of the combustion in the turbine and the conditions when the turbine is in Mode 6 are a good precursor to "normal operation". After the turbines are stable in Mode 6, ammonia injection is activated to the SCR and NO_x and CO emissions limits established for "normal operation" are met. Generally this occurs somewhat above 50 percent load, but is variable depending on ambient and operating conditions.

The permittee proposed to define normal operation as "stable operation of the SCR in turbine operating Mode 6".

IDEM, OAQ does not believe this definition is adequate but understands that there is a variation in the turbine's performance under the ambient and it's performance under the ISO conditions. In older information available from GE power system website about the performance of GE 7 FA turbines it was stated that, the turbine can reach 9 ppm outlet NO_x concentration at 50% load under ISO conditions. As observed in the actual practice at various similar facilities it is observed that this is not entirely true for the combustion turbines in combined cycle mode due to the presence of heat recovery steam generators. Therefore, the turbine might need to reach up to 70% load to achieve normal operation and SCR inlet NO_x concentration in the range of 9-12 ppm, so that the outlet NO_x concentration can be controlled below 3.0 ppm, the BACT level of control for NO_x

emissions under steady state condition. Therefore, the normal operation in the permit is modified to (70 percent load or 3 ppm NO_x whichever occurs first).

Therefore, the following conditions are changed as follows (changes are bolded and crossed out for emphasis):

D.1.2 Nitrogen Oxides (NO_x) Emission Limitations

(a) Pursuant to 326 IAC 2-2 (PSD Requirements) and 326 IAC 2-3 (Emission Offset Requirements), each combustion turbine/steam generating unit shall comply with the following:

- (1) During normal operation (~~50 percent load or more~~ **70 percent load or outlet SCR NO_x concentration of 3 ppm whichever occurs earlier**), the NO_x emissions from each combustion turbine stack shall not exceed 3.0 ppmvd at 15 percent oxygen, based on a 3-hour rolling average, which is equivalent to 19.5 pounds NO_x per hour at ISO conditions.
- (2) During normal operation (~~50 percent load or more~~ **70 percent load or outlet SCR NO_x concentration of 3 ppm whichever occurs earlier**), the NO_x emissions from each combustion turbine stack, when its associated duct burner is operating, shall not exceed 3.0 ppmvd at 15 percent oxygen, based on a 3-hour rolling average, which is equivalent to 38.0 pounds NO_x per hour at ISO conditions.

D.1.3 Carbon Monoxide (CO) Emission Limitations

(a) Pursuant to 326 IAC 2-2 (PSD Requirements), each steam generating unit shall comply with the following:

- (1) During normal operation (~~50 percent load or more~~ **70 percent load or outlet SCR NO_x concentration of 3 ppm whichever occurs earlier**), the CO emissions from each combustion turbine stack shall not exceed 0.016 pounds per MMBtu, which is equivalent to 28.0 pounds CO per hour.
- (2) During normal operation (~~50 percent load or more~~ **70 percent load or outlet SCR NO_x concentration of 3 ppm whichever occurs earlier**), the CO emissions from each combustion turbine stack, when its associated duct burner is operating, shall not exceed 0.037 pounds per MMBtu, which is equivalent to 93.7 pounds CO per hour.

(b) The Permittee has requested the change of the startup/shutdown emission limitations from a concentration basis (ppmvd) averaged over a startup or shutdown period, to a mass emission limit (lb/startup or lb/shutdown).

IDEM, OAQ-s recent experience with this type of operation has shown that the startup and shutdown limits in pounds per event are more appropriate and adequately shows compliance with BACT requirements. In addition, IDEM, OAQ decided that the startup performance testing is not reliable because of the high variability of the flow conditions and instead will require the Permittee to maintain CEMs data to show compliance with startup and shutdown limits.

This requested change will not affect allowable emissions during startup/shutdowns on an annual basis. Therefore, the following conditions are changed as follows (changes are bolded and crossed out for emphasis):

D.1.2 Nitrogen Oxides (NO_x) Emission Limitations

- (a) Pursuant to 326 IAC 2-2 (PSD Requirements) and 326 IAC 2-3 (Emission Offset Requirements), each combustion turbine/steam generating unit shall comply with the following, **excluding startup and shutdown periods**:
- (1) During normal operation (70 percent load or outlet SCR NO_x concentration of 3 ppm whichever occurs earlier), the NO_x emissions from each combustion turbine stack shall not exceed 3.0 ppmvd at 15 percent oxygen, based on a 3-hour rolling average, which is equivalent to 19.5 pounds NO_x per hour at ISO conditions.
 - (2) During normal operation (70 percent load or outlet SCR NO_x concentration of 3 ppm whichever occurs earlier), the NO_x emissions from each combustion turbine stack, when its associated duct burner is operating, shall not exceed 3.0 ppmvd at 15 percent oxygen, based on a 3-hour rolling average, which is equivalent to 38.0 pounds NO_x per hour at ISO conditions.
 - ~~(3) During periods of startups or shutdowns (less than 50 percent load), the NO_x emissions from each combustion turbine stack shall not exceed 70 ppmvd at 15 percent oxygen. The startup or shutdown period shall not exceed two (2) hours. The duct burners shall not be operated until normal operation begins.~~
 - ~~(4)~~ (3) Each combustion turbine shall be equipped with dry low-NO_x burners and operated using good combustion practices to control NO_x emissions.
 - ~~(5)~~ (4) A selective catalytic reduction (SCR) system shall be installed and operated at all times, except during periods of startup/shutdown, to control NO_x emissions.

D.1.3 Carbon Monoxide (CO) Emission Limitations

- (a) Pursuant to 326 IAC 2-2 (PSD Requirements), each steam generating unit shall comply with the following, **excluding startup and shutdown periods**:
- (1) During normal operation (70 percent load or outlet SCR NO_x concentration of 3 ppm whichever occurs earlier), the CO emissions from each combustion turbine stack shall not exceed 0.016 pounds per MMBtu, which is equivalent to 28.0 pounds CO per hour.
 - (2) During normal operation (70 percent load or outlet SCR NO_x concentration of 3 ppm whichever occurs earlier), the CO emissions from each combustion turbine stack, when its associated duct burner is operating, shall not exceed 0.037 pounds per MMBtu, which is equivalent to 93.7 pounds CO per hour.
 - ~~(3) During periods of startups or shutdowns (less than 50 percent load), the CO emissions from each combustion turbine stack shall not exceed 110 ppmvd at 15 percent oxygen. The startup or shutdown period shall not exceed two (2) hours. The duct burners shall not be operated until normal operation begins.~~

- ~~(4)~~ **(3)** Good combustion practices shall be applied to minimize CO emissions.

~~D.1.9 Annual Emission Limitations~~

~~Pursuant to 326 IAC 2-2 (PSD Requirements) and 326 IAC 2-3 (Emission Offset Requirements), the annual source emissions, including startup and shutdown operations, shall not exceed 262 tons of NOx per year and 571 tons of CO per year, based on a 12 consecutive month period.~~

D.1.9 Startup and Shutdown Limitations for Combustion Turbines

Pursuant to 326 IAC 2-2 (PSD Requirements) each combustion turbine shall comply with the following:

- (a) A Startup or shutdown period shall not exceed four (4) hours. Each turbine shall not exceed 473 hours per year for startups and 260 hours per year for shutdowns.**
- (b) The NOx emissions from each combustion turbine stack shall not exceed 510 pounds per startup and 49 pounds per shutdown. Each combustion turbine shall not exceed 41.5 tons per year of startup and shutdown emissions.**
- (c) The CO emissions from each combustion turbine stack shall not exceed 1,571 pounds per startup, and 220 pounds per shutdown. Each combustion turbine shall not exceed 168.7 tons per year of startup and shutdown emissions**

D.1.13 Performance Testing

- (a) Pursuant to 326 IAC 2-1.1-11, 326 IAC 2-2, 326 IAC 2-3, and 326 IAC 12, the following compliance stack tests for each combustion turbine stack shall be performed within 60 days of commercial operation, as defined in Condition C.5, but no later than 180 days after initial start-up:**
 - (1) Combustion Turbines (Normal Operation - 50 percent load or more 70 percent load or outlet SCR NOx concentration of 3 ppm whichever occurs earlier) - PM, opacity, and VOC emission limits established in D.1.1(a), (c)(1), (d), (e)(1) and D.1.5(a)(1) shall be demonstrated for each combustion turbine at maximum load;**
 - (2) Combustion Turbines (Normal Operation - 50 percent load or more 70 percent load or outlet SCR NOx concentration of 3 ppm whichever occurs earlier) - NOx and CO emission limits of D.1.2(a)(1) and D.1.3(a) shall be demonstrated at four points in the normal operating range of each combustion turbine, including the minimum point in the range and peak load;**
 - ~~(3) Combustion Turbines (Cold Startup Operation - less than 50 percent load) - NOx and CO emission limits of D.1.2(a)(3) shall be demonstrated for each combustion turbine during startup mode; and~~
 - (4) (3) Combustion Turbines and Duct Burners (Normal Operation - 50 percent load or more 70 percent load or outlet SCR NOx concentration of 3 ppm whichever occurs earlier) - PM,**

PM₁₀, opacity, NO_x, CO, VOC, formaldehyde and ammonia emission limits established in D.1.1(b), (c)(2), (d), (e)(2), (f)(1), D.1.2(a)(2), D.1.3(b), D.1.5(a)(2), D.1.7 and D.1.8 shall be demonstrated for each combustion turbine at maximum load when its associated duct burners are in operation.

D.1.16 Recordkeeping Requirement

- (a)** The Permittee shall maintain records of the parameters stated in Operation Conditions D.1.6, D.1.10, D.1.13, D.1.14, and D.1.15 to demonstrate compliance with Operation Conditions D.1.1, D.1.2, D.1.3, D.1.4, D.1.5, D.1.7, D.1.8, and D.1.9.
- (b) To document compliance with Conditions D.1.9 (b) and D.1.9 the Permittee shall maintain records of the following:**
 - (1) The type of operation (i.e. startup or shutdown) with supporting operational data.**
 - (2) The duration of all startup and shutdown events and total hours of startup and shutdown.**
 - (3) The CEMS data, fuel flow meter data, and Method 19 calculations corresponding to each startup and shutdown period.**

D.1.17 Reporting Requirement

The Permittee shall submit the following information on a quarterly basis:

- (a)** records of excess NO_x emissions (defined in 326 IAC 3-5-7) from the continuous emissions monitoring system for each parameter described in Operation Condition D.1.14 to demonstrate compliance with Operation Condition D.1.2;
- (b)** records of excess SO₂ emissions (defined in 40 CFR 60.334(c)(2)) for the parameter described in Operation Condition D.1.15(b) to demonstrate compliance with Operation Condition D.1.4(b);
- (c)** monthly natural gas fuel usage records as required by Operation Condition D.1.15(d) to demonstrate compliance with Operation Condition D.1.1(f)(2) and D.1.10; and
- (d)** daily records of the ~~annual~~ **startup and shutdown** NO_x and CO emission records as required by Operation Condition D.1.9 to demonstrate compliance with ~~Operation Condition D.1.6 and PSD and Emission Offset Requirements pursuant to 326 IAC 2-2 and 326 IAC 2-3, respectively.~~

~~Indiana Department of Environmental Management~~
~~Office of Air Management~~
~~Compliance Data Section~~
~~Quarterly Report~~

Company Name: _____ Whiting Clean Energy, Inc.

Location: 2155 Standard Avenue, Whiting, Indiana 46394
Permit No.: CP-089-11194-00449
Source/Facility: Combustion Turbines and Duct Burners
Limits: 262 tons NOx per year, based on a 12 consecutive month period and
571 tons CO per year, based on a 12 consecutive month period

YEAR: _____

Month	Facility*	Pollutant	Emissions this Month, tons	Annual Emissions Last 12 Months, tons	Emission Limit, tons/12 consecutive month period
	Combustion Turbines and Duct Burners	NOx			262
		CO			571
	Combustion Turbines and Duct Burners	NOx			262
		CO			571
	Combustion Turbines and Duct Burners	NOx			262
		CO			571

* This limitation includes startup, shutdown and normal operations. Emissions from startup and shutdown operations shall be determined by multiplying the ppm data collected from a compliance stack test or CEM system by the maximum theoretical flow rate for startup and shutdown operations.

Submitted by: _____

Title / Position: _____

Signature: _____

Date: _____

Phone: _____

**Indiana Department of Environmental Management
Office of Air Management
Compliance Data Section**

Quarterly Report

Company Name: Whiting Clean Energy, Inc
Location: 2155 Standard Avenue, Whiting, Indiana 46394
Permit No.: 089-11194-00449
Source: Two (2) Combustion Turbines

Limit: 240 startup/shutdown per twelve month period (Startup or shutdown shall not exceed 4 hours)

Month: _____ Year: _____

Day/Turbine#	1	2	Day/Turbine#	1	2
1			17		
2			18		
3			19		
4			20		
5			21		
6			22		
7			23		
8			24		
9			25		
10			26		
11			27		
12			28		
13			29		
14			30		
15			31		
16			no. of deviations		

9 No deviation occurred in this quarter.

9 Deviation/s occurred in this quarter.

Deviation has been reported on: _____

Submitted by: _____

Title / Position: _____

Signature: _____

Date: _____

Phone: _____

- (c) The permittee requested the addition of a Hexane limitation to the permit to limit the emissions below the major source thresholds for HAPs. A limit of 0.0005 lb/MMBtu would limit Hexane below major source thresholds as follows:

Emissions from Combustion Turbines:

$$0.0005 \text{ lb/MMBtu} * 1735 \text{ MMBtu/hr/CT} * 2 \text{ CT's} * 8760 \text{ hr/yr} * 1 \text{ ton/2000 lb} = 7.6 \text{ tpy}$$

Emissions from Duct Burners:

$$0.0005 \text{ lb/MMBtu} * 821 \text{ MMBtu/hr/DB} * 2 \text{ CT's} * 5000 \text{ hr/yr} * 1 \text{ ton/2000 lb} = 2.1 \text{ tpy}$$

$$\text{Total Hexane Emissions} = 7.6 \text{ tpy} + 2.1 \text{ tpy} = 9.7 \text{ tons per year}$$

Therefore, the following conditions are changed as follows (changes are bolded and crossed out for emphasis):

D.1.7 Formaldehyde **and Hexane** Limitations

Pursuant to 326 IAC 2-1.1-5 (Air Quality Requirements), the formaldehyde from each combustion turbine stack shall not exceed 0.0005 pounds of formaldehyde per MMBtu **and the hexane emissions from each combustion turbine stack shall not exceed 0.0005 pounds of hexane per MMBtu**. The combined emissions from each combustion turbine stack shall not exceed 10 tons per year **of formaldehyde or 10 tons per year of hexane**.

Conclusion

The construction of this proposed modification shall be subject to the conditions of the attached proposed Significant Modification No. 167-15295-00123.

Air Quality Analysis Addendum

Introduction

Whiting Clean Energy (WCE) has requested alternate start-up/shutdown carbon monoxide (CO) limitations from those contained in the existing operating permit (CP 089-11194-00449). The site consists of two combustion turbine units with heat recovery steam generators (HRSG), a cooling tower and a condensing steam turbine generator. The site is located in Lake County at 2155 Standard Avenue, Whiting, Indiana. The site coordinates are Universal Transverse Mercator (UTM) 461033.0 East and 4613099.0 North. The site was modeled to assess the impact of the changes on the short term (1-hour) CO National Ambient Air Quality Standard (NAAQS). Lake County is designated as in maintenance for attainment for the CO NAAQS. The standard for CO is set by the United States Environmental Protection Agency (U.S. EPA) to protect the public health and welfare.

The application was received by the Office of Air Management (OAM) on July 22, 2002. This Air Quality Analysis Addendum document provides the Air Quality Modeling Section's review of the application.

Air Quality Analysis Objectives

The OAM review of the air quality impact analysis portion of the permit application will accomplish the following objective:

- A. Demonstrate that the source will not cause or contribute to a violation of the National Ambient Air Quality Standard (NAAQS).

The OAQ review of the air quality impact analysis portion of the permit application demonstrates that the source will not cause a violation of the National Ambient Air Quality Standards (NAAQS) for the 1-hour CO standard.

Summary

Whiting Clean Energy (WCE) has requested an alternate start-up/shutdown limitation for CO from those contained in the existing operating permit (CP 089-11194-00449). Modeling was done to assess the impact of the proposed changes on the short-term (1-hour) carbon monoxide (CO) National Ambient Air Quality Standard (NAAQS). Only start-up CO was modeled given that emissions during the shutdown period are significantly lower than during start-up. Modeling results taken from the Industrial Source Complex Short Term (ISCST3) model showed that the impact of CO emissions were predicted to be less than the NAAQS for purposes of a National Ambient Air Quality Standards analysis.

Part A - Pollutants Analyzed for Air Quality Impact

This request was for modification of the start-up/shutdown limitations for 1-hour (short term) CO from Whiting Clean Energy. IDEM OAQ conducted modeling to ensure that the modification would not exceed the NAAQS for CO.

Part B - Significant Impact Analysis

An air quality analysis, including air dispersion modeling, was performed to determine the maximum concentrations of the source emissions on receptors outside of the facility property lines. The modeled emission rate was only for the 1-hour CO start-up emissions since the shut down emissions are significantly lower than those at start-up.

Model Description

The Office of Air Quality review used the Industrial Source Complex Short-Term (ISCST3) model, Version 3, dated April 10, 2000 to determine maximum off-property concentrations or impacts for each pollutant. All regulatory default options were utilized in the United States Environmental Protection Agency (U.S. EPA) approved model, as listed in the 40 Code of Federal Register Part 51, Appendix W A Guideline on Air Quality Models. The Auer Land Use Classification scheme was referenced to determine the land use in a 3-kilometer (1.9-mile) radius from the source. The model also utilized the Schulman-Scare algorithm to account for building downwash effects. Stacks associated with the proposed combined cycle power facility are below the Good Engineering Practice (GEP) formula for stack heights. This indicates that wind flow over and around surrounding buildings can influence the dispersion of concentrations coming from the stacks. 326 IAC 1-7-3 requires a study to demonstrate that excessive modeled concentrations will not result from stacks with heights less than the GEP stack height formula. These aerodynamic downwash parameters were calculated using U.S. EPA's Building Profile Input Program (BPIP).

Meteorological Data

The meteorological data used in the ISCST3 model consisted of a 5-year period (1991-1995) of wind speed and direction from 60 meters above ground level. This data was measured at the Lake County Attainment Task Force site in Hammond, Indiana. Urban dispersion coefficients were utilized.

Receptor Grid

Ground-level points (receptors) surrounding the source were input into the model to determine the maximum modeled concentrations that would occur at each point. The receptor grid network included fenceline receptors and a dense network of receptors surrounding the plant.

Modeled Results

Maximum modeled concentrations for 1-hour CO for the 5-year period are listed below in Table 2 and are compared to the 1-hour CO primary NAAQS.

TABLE 2 – Summary of OAQ Significant Impact Analysis for Lake County (ug/m3)				
<u>Pollutant</u>	<u>Year</u>	<u>Time-Averaging Period</u>	<u>Whiting Maximum Modeled Impacts</u>	<u>1-Hour NAAQS (ug/m3)</u>
CO	1991	1-hour	1358	40,000
CO	1992	1-hour	1278	40,000
CO	1993	1-hour	1344	40,000
CO	1994	1-hour	1313	40,000
CO	1995	1-hour	1442	40,000

The modeled concentration for 1-hour CO at all applicable time-averaged periods for all 5 years were below the NAAQS. No significant short-term or long-term health impacts are expected as a result of the proposed modification and no further refined air quality analysis is required.